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MILITARY ★ CIVIL ★ COMMERCIAL AVIATION

Carrier Jets Over Korea

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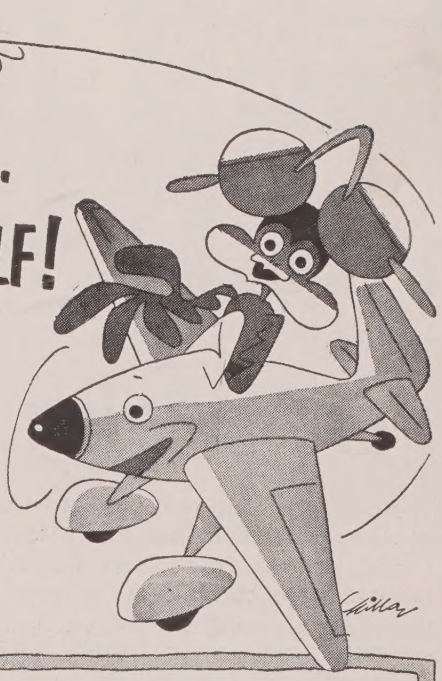

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HQS, FEAF COMBAT CARGO COMMAND, AIRLIFT BASE, JAPAN—(A.T.)—Again exercising the flexibility of airlift operations, eighteen C-119 Flying Boxcars of the 314th Combat Cargo Wing roared out from this base yesterday with 113 tons of critically needed war materials for embattled United Nations forces in the Chosin Reservoir area.

Immediately after the emergency request for these supplies was received, loading crews began lashing the mixed cargo of gasoline, rations, ammunition and other materials to pallets and loading them aboard the huge cargo carriers. Each aircraft departed for the drop zone as soon as it was loaded.

Seven of the Flying Boxcars reached the drop zone before ... called a halt to

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B-7 Check one ☐ Veteran ☐ Non-Veteran

SKYWAYS

Cover: Chance Vought F7U *July, 19*

Carrier Jets Over Korea — Lt. Cmdr. M. W. Cagle, USN
Flattop fighters prove proficiency of jet operations off carriers

New Exec Twin-Bonanza
Beech Aircraft adds a new executive airplane to its stable of good planes

Aerial Braille — S/Sgt. S. E. Turner
Better to be sure than sorry, so AF in Germany practices jet A-W flying

Up Front in a "Six" — Len Morgan
This is the "front office" of a DC-6...and pilots call it "the best"

New to the "U" Bird — Capt. Hubard Kuokka, USMC
A Marine transport pilot trades in a cargo plane for a Corsair

Civil Air Patrol's 10th — Lt. Harold B. Nelson, USAF
USAF auxiliary, the CAP, joins Armed Forces Day celebration in the U.S.

Give 'em a Jet — Eliot Tozer
Military airmen detail reasons why they like the jets best

U.S. Air Navy
F'ward by Vice-Admiral J. H. Cassady, USN
A special section: photos and facts about the Navy's air fleet

USN Plane Facts and Figures
A chart that details the specifications and performance of Navy planes

Navy's 40th
Navy looks back at 40 years of air operations

Dilbert — S. H. Warner & Robt. Osborn
Carelessness is a shortcut to disaster and plane demolition

Fletcher FL-23
FL-23 was designed for observation and reconnaissance work

Jet Buck Private
Experimental program tests pulse-jet XA-6

NAVICOM
Radio Lay-out Eases Operation — Earl O. Dahl
Radar to Rescue — Col. N. F. Silsbee
Radio Added to Commercial Tix

Air Your Views 6
Military News 8
Hangar Flying ....
CAOA Report ....

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PLANE FAX

Quick picture of

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Budget-tips for airborne vacationers

"You can't beat flying to your chosen vacation spot these sunny summer days," writes Ben Hitchens, owner and operator of Vanguard Aviation Corp., San Fernando Valley Airport. "But there are ways to cut operating costs and trip expenses.

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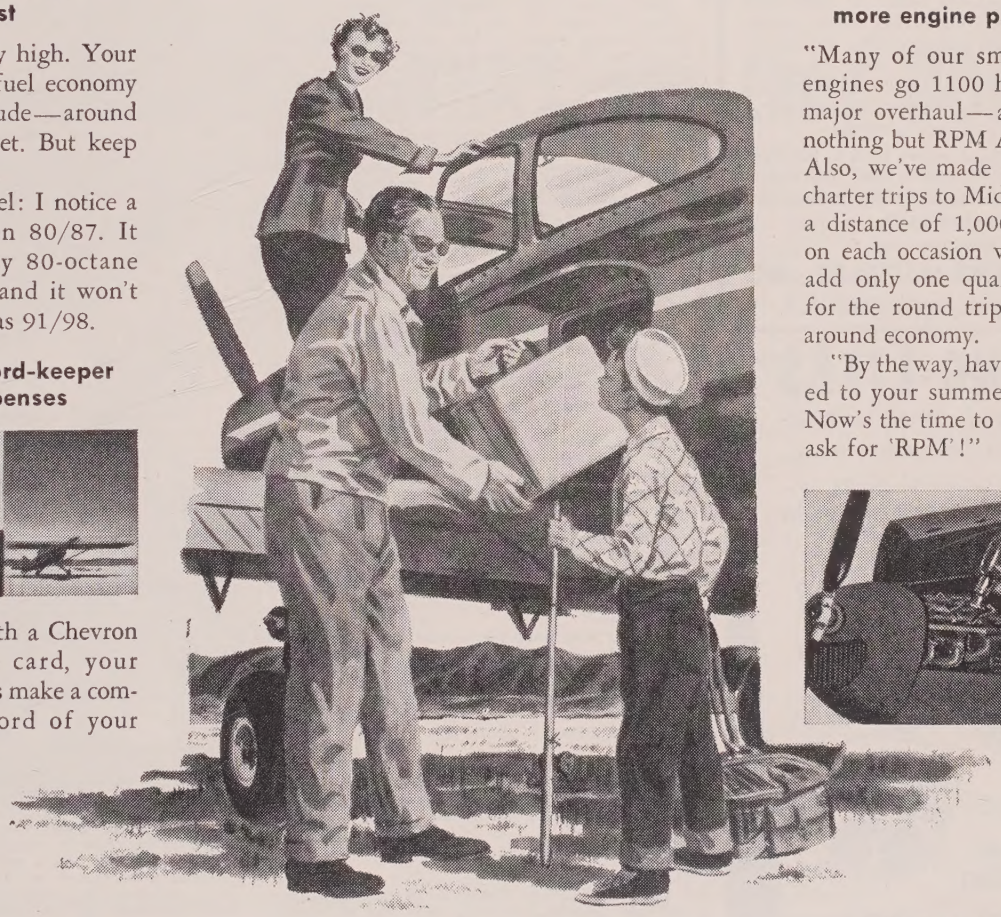
For one thing, fly high. Your speed, range and fuel economy increase with altitude—around 7000 to 9,000 feet. But keep your mixture lean.

"More about fuel: I notice a swing to Chevron 80/87. It beats all ordinary 80-octane fuels for power, and it won't cost you as much as 91/98.

Automatic record-keeper for trip expenses

"When you fly with a Chevron National Credit card, your monthly statements make a complete, handy record of your flight expenses."



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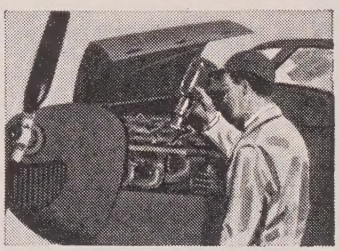
"Many of our small aircraft engines go 1100 hours before major overhaul—and they use nothing but RPM Aviation Oil. Also, we've made a number of charter trips to Midland, Texas, a distance of 1,000 miles, and on each occasion we've had to add only one quart of 'RPM' for the round trip. Means all-around economy.

"By the way, have you switched to your summer grade oil? Now's the time to do it . . . and ask for 'RPM'!"



T.M.'S "RPM," "CHEVRON," REG. U.S. PAT. OFF.

TIP OF THE MONTH

Avoid danger of water in fuel

Guard your fuel tanks against trouble-breeding water condensation by refueling (as airlines do) right after landing. Leaves minimum air space for condensation while plane is idle.

Ben Hitchens, Manager, Vanguard Aviation Corp.

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AIR YOUR VIEWS

Lighter Caution

Gentlemen:

On a recent trip to Central America with my fellow traveler, W. W. Bower, manager of our local Kresge store, we had quite an experience involving Mr. Bower's cigarette lighter. I am writing you the details of this experience so as to help others avoid what might be a disaster.

We were flying at about 14,000 feet from Acapulco to Mexico City. The cigarette lighter was one of the newer types with liquid naphtha (there was no cotton; the liquid was free in the container, but there was a wick). Bower casually reached for his lighter and, as he opened the cap, all the liquid naphtha was forced out through the wick (like ink being forced out of a pen at altitude). It was cold at 14,000 feet and the vents were closed. Fortunately, Bower did not turn the flint wheel, and neither my brother nor I smoke, so there was no fire that followed. But the naphtha fumes filled the cabin and some naphtha spilled on our clothes. I quickly opened the wing vents, getting sufficient air into the cabin to dissipate the naphtha fumes.

I only relate this to you for what it might be worth in preventing other pilots from getting into difficulty.

MAX L. WEINBERG
N 5535C

Quincy, Illinois

Thank you, Pilot Weinberg. We have sent a copy of your interesting letter to Flight Safety Foundation, and will report at a later date their comments regarding your experience. We, too, feel it could have resulted in air disaster. Here's hoping pilots will heed your comments.—ED.

T-33 Not F-94

Gentlemen:

In your May issue you printed an article about production pilots. In the bottom right-hand corner of page 15 you have shown Pilot-Author Patton climbing into the cockpit of what you say is an F-94. Isn't that a T-33 jet trainer?

PFC. E. E. RODGERS

Sheppard AFB
Texas

We salute you, Pfc. Rodgers. That is a T-33 . . . and our caption writer (me) is doing time in the stock room for his error.—ED.

PT-26 or . . .

Gentlemen:

On page 33 of your May issue there is a plane pictured making a landing too close to another aircraft. Isn't that plane a modified PT-26?

DAVE HOSTERMAN

Wichita, Kansas

Nope. In this case the plane is a modified PT-19. There are quite a number of them out California way, and our West Coast man assures us they are PT-19's.—ED.

Fido Fuming

Gentlemen:

Re. FIDO in the May issue, rumor is that FIDO is so expensive to operate the Government has decided it would be cheaper to burn dollar bills. They are now working out a plan to give all holders of dollar bills 10-dollar bills in exchange so the experiment can proceed.

Re. Seth's Safety Quiz, new procedure (#3) calls for open windows in multi-engine equipment when using automatic fire-gas equipment unless crew is equipped with oxygen masks. According to one report a recent crash was attributed to crew asphyxiation from automatic fire-fight aids.

TOM MATHE
C-2910

Monterey, Calif.

Mr. Mathews, thanks for your most interest letter . . . and thanks for the tips. Re. FIDO if it saves one plane, it'll be worth all that's ready gone into it, dollar-wise, and plenty m If it doesn't . . . well . . . it was a try and don't find answers without trying.—ED.

Attn.: Air Force

Gentlemen:

There is an Air Force recruiting ad on p 5 of the March issue which states that the e neer on a B-29 is "awaiting the pilot's sig to return props to high pitch for take-off a engine run-up."

In all my flying career, both as an engi and as a pilot, I have never used or been as to use high pitch for take-off. It should be pitch, high rpm.

E. E. AM

Brunswick, Georgia

You're so right, Mr. Amos . . . and so are hundreds of others who have written us regard that particular Air Force ad. Apparently, an thusistic copywriter got his switches mixed, t escaped detection a la Houdini. At any rate, are right. The Air Force states "the engine the B-29 in the picture are not running, and engineer is awaiting instructions from the p prior to starting the engines."—ED.

Speedy Mustang

Gentlemen:

I have heard that the F-51 *Mustang* was n in 90 days—that is, from when it first hit drawing board to the time the first one f One of my friends argues that this is true, I don't see how it is possible when it usually t 5 years.

J. ARMSTRO

Tuscaloosa, Alabama

Your friend is about right, Mr. Armstrong, that feat stands as a top example of our airc industry's ingenuity and ability. The F-51 actu was ready for production in 100 days . . . days earlier than the deadline given North A ican by the Air Force and the RAF who jo requested the plane in 1941. When you comb that "miracle" of development of production the excellence of the airplane itself, you g good picture of the capabilities of American dusty. The F-51 Mustang *is still a good airpl and it's doing a terrific job for U. N. force Korea, according to a recent report.*—ED.

Lightplane Jet

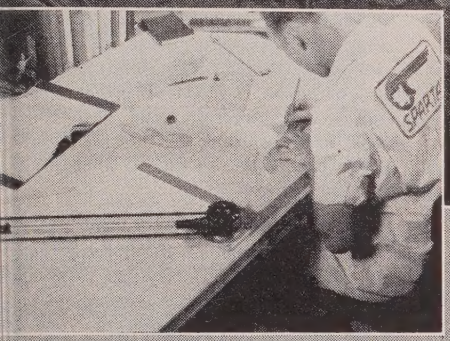
Gentlemen:

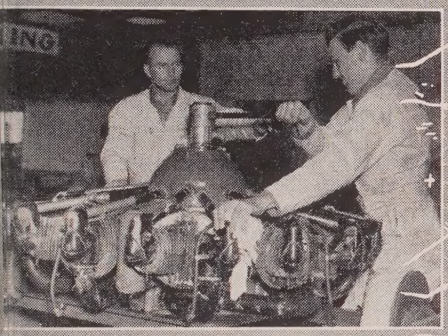
I think I remember something in your maga once about a jet engine suitable for a lightpl I believe it was manufactured by a foreign en company. Could you please give me the name address of that company?

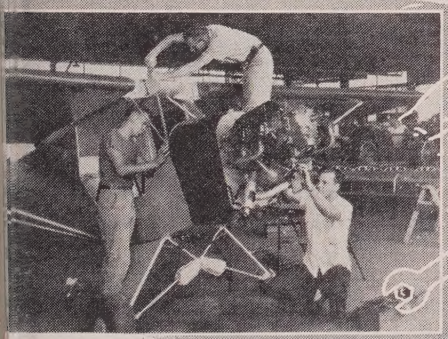
L. A. RAMS

c/o Postmaster
Seattle, Washington

That jet engine for a lightplane was buil Fouga Et Cie, Aire-Sur-Adour, Landes, Fra The plane that was powered by the tiny jet en was then called Cyclone, *but is now known as* Sylph. *It was in the United States on a dem stration tour last year.*—ED.







WHAT are they DOING?

The young men in these pictures are on the jobs for which they trained; good-paying jobs that require skilled hands. Only a few short years ago they only hoped to hold such positions. Study and training was the solution. You can follow in their footsteps. Thousands of new employees are needed in aviation — men with training to build, fly and service the speedier, more powerful and longer-range aircraft. The only limit to your progress in aviation is lack of training and skill.

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CHASE XC-123A is shown here being hauled to its take-off position. This version of the 123 is powered by four GE J-47 jet engines mounted in pairs under the plane's wings

MILITARY AVIATION

Jet Cargo Planes

When it comes to versatility, the Chase 123 is a flying example. It was originally flown as a glider; then later powered by two piston engines (YC-123); and another version (XC-123A) is now powered by four GE J-47 jet engines. Successful test flights recently were made by the XC-123A, thus making it the first aircraft in the world to have flown successively powerless, piston powered and jet powered. According to estimates, the jet-powered XC-123A attained a speed in excess of 300 mph in a low pass over the Chase field.

Airborne Lifeboats

Large 30-foot lifeboats with supplies and space for 15 people are now stationed at strategic points along the world's airways to be dropped from SB-29 search planes to survivors within a few hours notice of sea disasters. Now in operation by the Air Rescue Service, the lifeboats are equipped with a marine engine and carry enough fuel for more than 800 miles. In flight they are carried under the belly of special SB-29's and are dropped with precision via a parachute 100 feet in diameter.

Work is now progressing to equip the A-3 boats with radio control (*SKYWAYS, May*) which will permit the SB-29 crew to start the A-3's engine by remote control after it has landed and to steer the boat to survivors. The lifeboat itself is built by Edo Corporation, well-known designers and builders of all-metal seaplane floats.

Convertaplane Awards

The Army and Air Force jointly have named three aircraft manufacturers for development work Phase 1 on convertaplane designs. The companies winning contracts were Sikorsky, Bell and McDonnell. Of 19 designs submitted by 17 companies in a competition conducted by the Air Materiel Command, the three winning designs were selected as the most logical exposition of three approaches to the problem of combining vertical flight and horizontal flight.

Production Frozen

A recent USAF directive freezes production of planes for the Air Force to the current combat types. This directive, it is believed, will bring to an end development work on the B-47C, four-jet version of the six-engine B-47B. However, the order does not alter development, testing and production programming of still experimental aircraft. It does halt major modification on current production aircraft. Boeing's plans for an all turboprop-powered version of the B-47 are expected to go unchanged, design for the new plane (not merely modification proposals) having already been submitted to the AF.

Arctic Exercise Firestep

The newly activated 18th Air Force (Troop Carrier) supplied 24 Fairchild C-119's for the combined Army-Navy-Air Force Arctic maneuvers which took place in Alaska in the early spring. Called "Exercise Firestep," its purpose was to test ground and air defense in the Alaskan theater, with the major activities centered in the Kodiak-Anchorage-Fairbanks area. One important aspect of the exercise was to determine the ability of military forces, operating under extremely cold conditions, to repair damages to installations and facilities caused by enemy action.

Turbine Prop

Air Materiel Command of the USAF is presently testing a 19-foot prop develope Hamilton Standard under sponsorship o Air Force. This propeller is reported t the largest ever built for turbine eng and it was developed for powerplants de ing over 5,000 horsepower. Not only ca prop be used on the medium horsep turbine engines but it can also be use highest horsepower piston engines. Al can be adapted for mating with another peller of the same 19-foot diameter, usi connecting mechanism, to make an e bladed dual-rotation model capable of dling even greater engine powers.

News Notes

NORTHROP AERONAUTICAL IN TUTE of Hawthorne, California, has selected by the USAF Air Training mand as a training center for Air F ground personnel. The Institute has designated as the 3345th School Squa and new AF recruits who have comp their basic training will be schooled 16½ week course to qualify them as sk airframe repairmen.

PIASECKI HELICOPTER has named Douglas vice president in charge of engi ing. Mr. Douglas formerly was chief engi of Piasecki Helicopter Corporation.

REPUBLIC AVIATION has announced Robert B. Kinkead has joined Republi Director of the European Division. Mr. kead was an industrial aircraft specialist the Defense Supply Board of the North lantic Treaty Organization.

USAF has increased its orders for pr tion of the Northrop *Scorpion* F-89 weather interceptors for the second tim less than three months. The exact numb F-89's ordered was not disclosed, but it raise Northrop's backlog to an all-time of about $300,000,000.

RHEEM MFG. CO., builders of shipping containers, is delivering steel tainers to the Air Force for the shippin jet engines. The jet engines are "can and shock-mounted and sealed against midity. They protect jet engines from aging vibration in transit and from har effects of moisture during storage ove definite periods of time.

JET ENGINES come in cans these days. To protect the engines from moisture and vibr in shipment, metal containers have been developed for Air Materiel Command by Rheems

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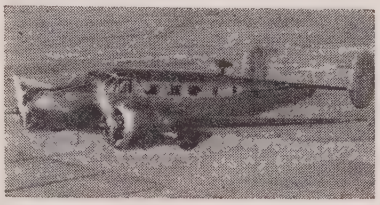
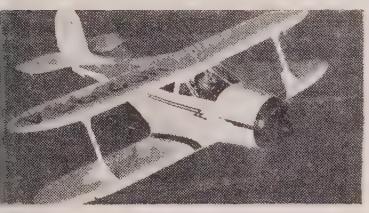
RUMMAN WIDGEONS—7 FOR ALE—G-44, #9995HS, has 576 hours. yros. Loop. 6 engines and propellers in- uded. October license. $10,850. Also; -44A, #8066OS, with 550 hours. 4 en- nes included. Metal props. Gyros. HF. ADF. $25,000. Consult **POWERS GEORGE.** "Airplanes Everywhere."



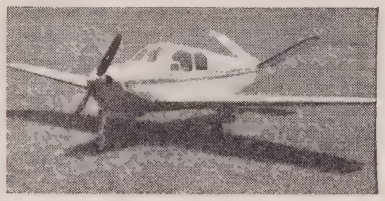
BEECHCRAFT TWINS — 19 FOR SALE—$20,000 UP. D-18-S Executive, #84078S, has 850 total hours. Zero time aircraft and engines since complete overhaul. Nose tank. Gyros. VHF. ADF. Marker beacon. Engines drilled hydromatics. $46,000. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

NAVIONS—45 FOR SALE—$4125 UP—1947, #95774S, has 120 hour, 1949 205HP engine. Bargain. $4250. Also; 1948, #4729KS, with 200 hours. 205 engine. Gyros. Omni. ADF. $7950. Also; 1950, #5530KS, with 50 hours. New. $12,000. Consult **POWERS & GEORGE.** "Airplanes Everywhere."



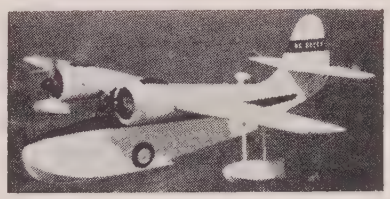
EECHCRAFT STAGGERWINGS—15 R SALE—$2800 UP. 1943, #6034OS, 150 hours since overhaul. 450HP W engine has 470 hours total. Over- uled propeller. New cables, brakes, tires. Gyros. Extras. Beautiful con- on. $4400. Consult **POWERS & ORGE.** "Airplanes Everywhere."

BELLANCA CRUISAIRS—21 FOR SALE—Standard 1946, #80857S, has 272 hours. $2650. Also; standard 1947, #78356S, with 395 hours. $3495. Also; 1948 Station Wagon, #78447S, with 170 hours. Special finish and interior. $4725. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

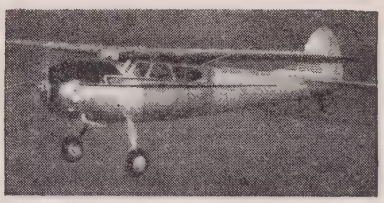


BEECHCRAFT BONANZAS — 24 FOR SALE—$6225 UP. Model 35, #3679VS, has 39 hours. Standard with gyros. Clean. Undamaged. $7500. Also; B-35, #552BS, with 478 hours. All 1950 improvements. Overhauled. Gyros. Omni. Extra tank. $10,850. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

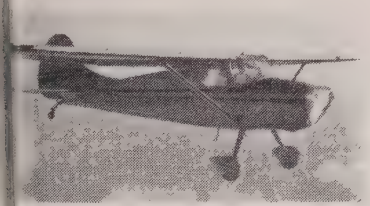
UBLIC SEABEES—30 FOR SALE 1500 UP—#6883KS, serial 751, has hours. Stainless cables. All bulletins. 5. Also; #6112KS, serial 1001, with 130 hours. All improvements. Stain- cables. Extra instruments. $2000. sult **POWERS & GEORGE.** "Air- es Everywhere."



GRUMMAN GOOSE AMPHIBIANS—4 FOR SALE—File #93S is a beautiful white airplane. Zero time since major overhaul. Engines 145 and 511 hours. Hydromatics. Airline instruments. Excellent radio. No expense spared. Make offer. Consult **POWERS & GEORGE.** "Airplanes Everywhere."



CESSNA 195'S—4 FOR SALE—1947, #4796NS, has 657 hours total. Full blind instruments. Radio compass. ADF. Best maintenance. $9750. Also; our File #273S, built in 1950 with 100 total hours. Standard ship. Equal to new. Hangared. $16,250. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

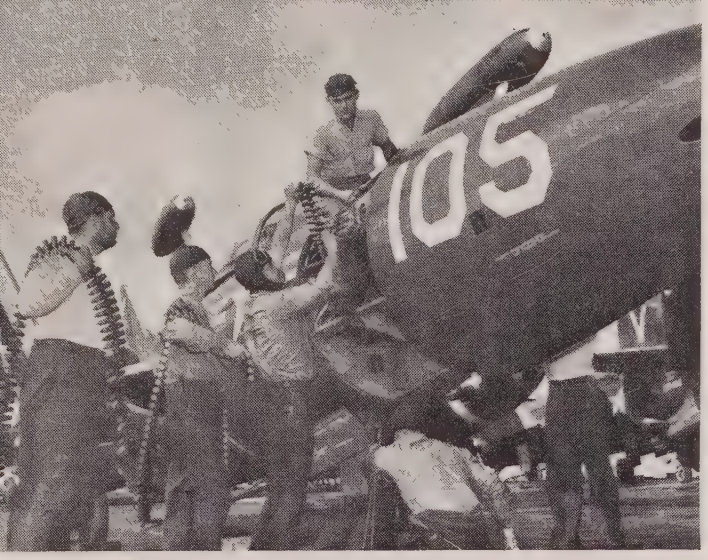


SNA 170'S—17 FOR SALE—$3000 1949 metal wing, #9475AS, has 168 . Metal propeller. Primary blind in- ents. Radio. Stall warning. Landing . Hangared. Never damaged. One r." All bulletins. Excellent. $5200. lt **POWERS & GEORGE.** "Air- s Everywhere."

SWIFT 125'S—23 FOR SALE—1947 deluxe, #3616KS, has 298 hours. Relicensed. Bargain. $1675. Also; 1950, #2836BS, with 238 hours. Extra tank. Gyro. Extras. $3500. Also; new 1950 deluxe Swift. 10 hours only. Cost $4496. Asking $3950. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

STINSON 165'S — 27 FOR SALE — $1950 UP. 1948 Station Wagon, #728-CS, has 310 hours. 2 metal propellers. Wheel pants. Primary blind instruments. November license. Excellent condition. $2800. With Narco omni-range installed $3700. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

L TYPES OF AIRPLANES AVAILABLE—DETAILS UPON REQUEST—LISTINGS SOLICITED



TASK FORCE 77—Ordnancemen load belts of 20-mm ammo into *Panther* prior to launching for strike against Reds

Navy jets pass flattop tests in carrier operations in Korean War

By LT. CMDR. M. W. CAGLE, USN

If the war in Korea has served no other purpose, it has demonstrated the value and usefulness of jet aircraft aboard carriers.

Aviation, since its birth in 1903, has been forced-fed by two world wars. The "police-action" in far-away Korea accelerated aviation's recent progress far beyond what could be considered normal.

The Navy first landed a jet on one of its flattops in 1946 off the Virginia Capes. It was a McDonnell FH-1 *Phantom,* flown by Lieutenant Commander Jimmy Davison. And right behind him came Lieutenant Colonel Marion Carl, USMC, in a converted F-80. Their successful landings were one beginning, and by early 1950, the assimilation of jet aircraft aboard carriers had advanced to the point where orders from the Navy Department went out to fleet commanders to keep at least one jet squadron aboard our carriers on foreign duty in the Mediterranean and the Far East.

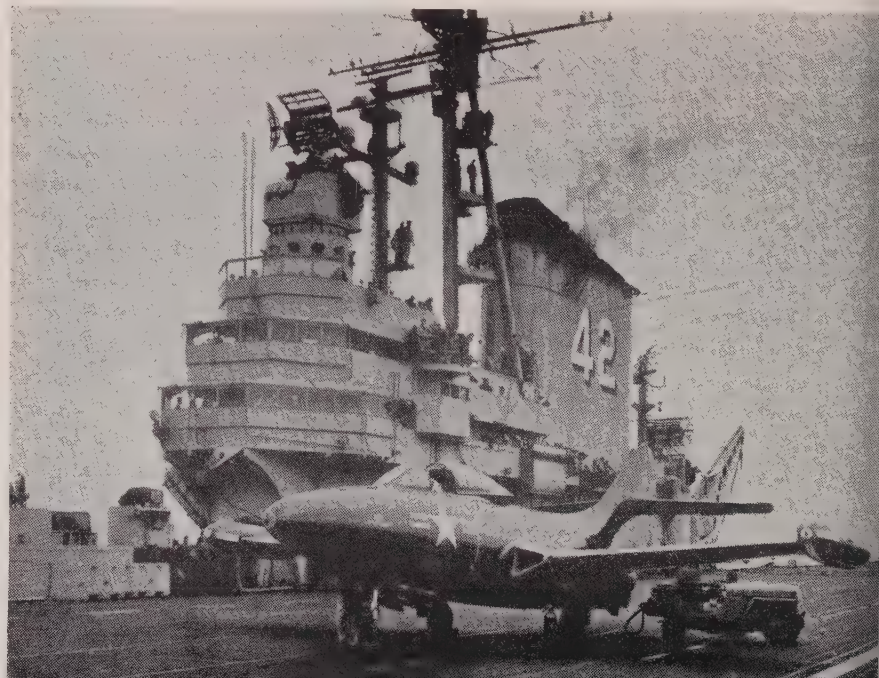
Thus, when the North Korean Communists invaded the Republic of Korea in June of 1950, the U. S. Navy had one aircraft carrier in the Philippine waters, the *USS Valley Forge,* and aboard it were two Grumman F9F *Panther* jet squadrons. The months ahead would see them in continual action.

The five-year lull between 1945 and 1950 was not without its problems in operating jet aircraft on carriers. There were even a few detractors of naval aviation who were predicting that the use of jets on flattops would never be practical. They were saying that jets didn't have the necessary acceleration to get off the carrier; that they were too tricky to fly slowy and that, as a consequence, the average pilot would find the carrier landing of a jet to be a dangerous and unproductive business. There were those who thought the gas-hungry jets would never attain sufficient endurance to remain airborne long enough from a carrier to make them tactically useful.

And there were technical difficulties which some said the Navy could never solve. How could handling crews in the confined space of a flight deck operate in close proximity to the white-hot temperature of the jet's tailpipe? What would prevent them from being sucked into their maws? Jets were propless, tricycle-type airplanes and the Navy had never operated such aircraft before. This meant a new and different barrier system would have to be designed to replace the tennis-type steel nets which kept errant pilots from crashing into the planes parked forward. On conventional planes, the barriers simply caught the propellor and the high landing gear. But jets had no props and the landing gear hugged the deck. A jet pilot who landed on a carrier rigged with the old-type barriers would only cut off his head if he ran into one of the fences.

From the beginning, the Navy took the position that a jet airplane was, nevertheless, still an airplane.

Thus, in the vacation years between 1945 and



JEEP POWER—Tricycle-geared Jeep is put into position for energizing jet engines to life

Carrier JETS Over Korea

FIREPOWER—Navy F9F is shown here in flight with its load of six 5-inch rockets; has 20-mm guns

1950, the Navy took advantage of the time to solve such problems. New barriers were designed and tested. They were made of—of all things—nylon. Operational problems were solved, so that by February of 1949, the Navy's squadron VF-171 flying FH *Phantoms* operated for six weeks over Vieques Island in the Caribbean from the flattop *USS F. D. Roosevelt.*

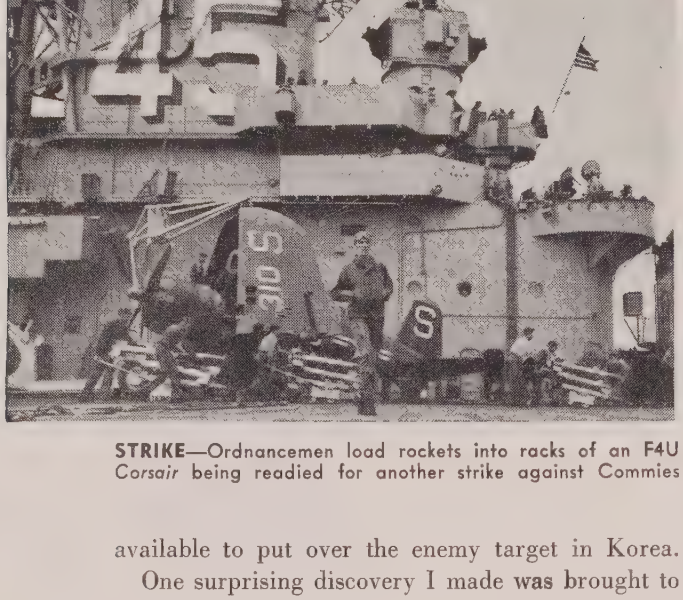
A recent trip to the Far East took me aboard several of our carriers which were operating jet aircraft. I talked to squadron commanders and pilots, mechanics and handling crews, ordnancemen and plane captains. How were the jets making out? Any problems? Did they like them? How did they compare with the prop planes?

Without exception, the answers were gratifying and educational.

Most of the maintenance people who had experience with both jet and conventional-type planes preferred working on the jets. For one thing, they could get at the jet easier. Ordnancemen could work on the guns while standing on the deck. Mechanics frequently did not need the high stands for their repair work. Checking an engine was simpler—pull it out in the open, perform your work while the engine was in its cradle—and put it back in. As a result, a complete 120-hour check on the jet engine took about half the time as for a prop engine. Obviously, quicker maintenance meant more planes

(*Continued on next page*)

FLATTOP—U.S. Navy's *Essex*-class carrier is one of several in U.N. action off Korea



STRIKE—Ordnancemen load rockets into racks of an F4U *Corsair* being readied for another strike against Commies

available to put over the enemy target in Korea.

One surprising discovery I made was brought to my attention by an Air-Group Maintenance officer. "The more you fly a jet," he told me, "the better it performs. After the ship stopped to refuel and replenish and our planes had been idle for awhile, we had plenty of maintenance work. But when our jets were flying steadily and heavily, our maintenance work was the easiest." From my own experience, I knew that for prop planes, the reverse was true. The more you fly them, the more bugs turn up.

Another maintenance advantage that a jet has over the prop plane in operating on a carrier is its ability to survive a barrier crash with little or minor damage. In the day-to-day operations on a flattop, there will be occasional mishaps. A pilot will misfly his plane, fail to catch a wire and "hit the fence." When a prop plane piles into the steel barriers, it frequently means a major overhaul for the aircraft, although pilots are rarely hurt in such accidents. The prop plane usually will require a new

LINE UP—Jeeps tow *Panthers* into position for take-off on strike against military targets in North Korea

engine and propellor, perhaps even new landing gear or wings. If the plane can be repaired aboard ship, it is often a week's work.

But when a jet plane hits the fence, the damage is far less. In the first place, the jet barriers are made of nylon, and they are designed to catch only the landing gear. At most, the jet suffers only superficial damage to its landing gear, and in many cases is flying again within three hours.

Maintenance-wise, the jets turned in performance figures that were amazing, especially when one remembers that this was their first taste of combat. On one carrier off Korea, both squadrons were able to maintain in the five-month period an average availability of 93 per cent! This means that better than 9/10's of the jets aboard were available for flight *at all times.*

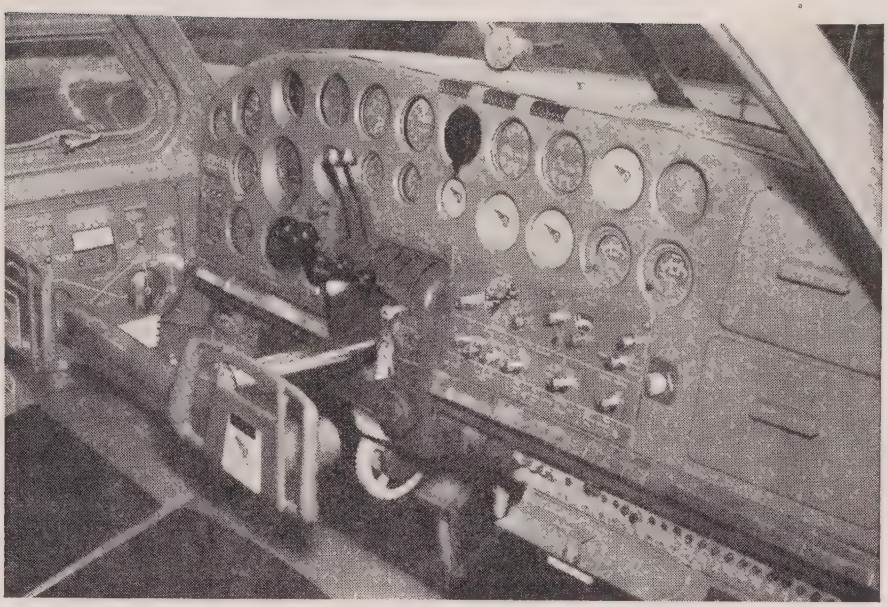
Operationally, the jet pilots off Korea found that they could land aboard a carrier as quickly and efficiently as the prop planes do. True enough, the average jet lands faster on a carrier than its counterpart, but to offset this higher landing speed, the fact the jet pilots have far better forward visibility, unencumbered by the bulk of a nose and engine, makes the landings just as successful and rapid. On most of the carriers, there was no appreciable difference in the routine landing interval between props and jets.

As for take-offs, the jets were invariably catapulted. Most carrier pilots preferred to be launched by the sling shot anyway, since it gives them a higher margin of flying speed above stalling. And what's more, the catapult launching interval was found to be faster for the jets than for the props. The explanation for this was simple.

"We can spot jets on the cat-track faster," one air officer told me, "because of the jet's tricycle landing gear. One of the handling crew mans the tow bar on the nose wheel. He guides the plane into position over the catapult more accurately and quickly than the prop pilot whose vision is obstructed by the nose and prop of his plane." During combat operations over Korea, it was found that a pair of jets could be launched almost simultaneously —one from each cat.

"The jets have one important wintertime advantage over the prop plane which we've learned out here in Korea," one pilot told me, "and that is their ability to operate quickly and efficiently in cold weather." He explained that the prop engine is hard to start in sub-freezing weather and must be warmed up slowly and thoroughly. On the other hand, the jet engine is easy to start no matter what the outside temperature; and best of all, no warm-up is required.

The flight crews and plane pushers on all the jet equipped flattops were loud in their praise of the jets for taking the bite (*Continued on page 57*



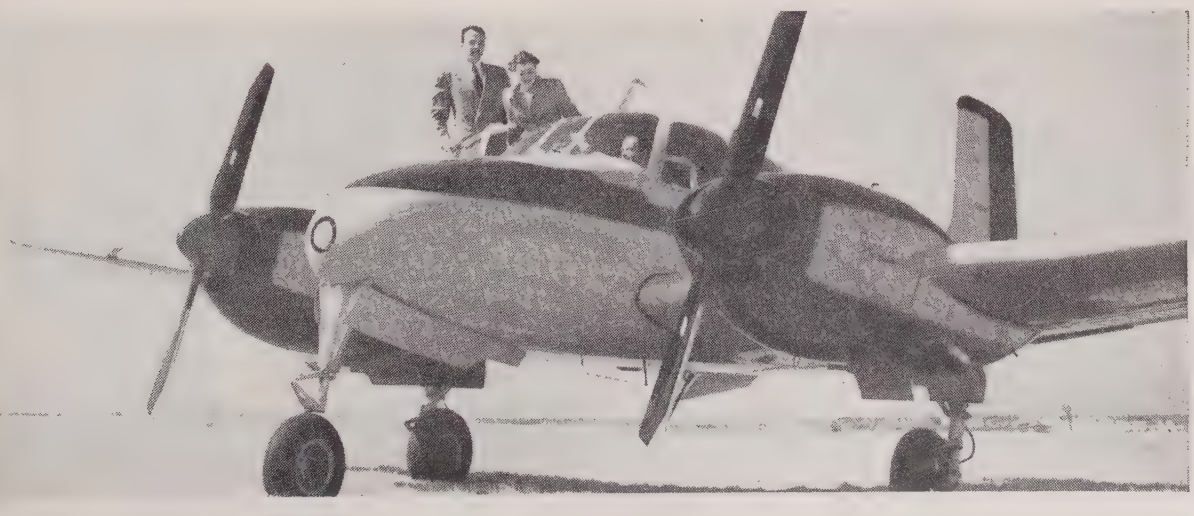
PANEL of the *Twin-Bonanza* is shock-mounted and well appointed. This panel includes radio installation. Additional space is provided for other instruments. Pilot, co-pilot, passenger sit in front seat, three in back

New Exec Twin-Bonanza

SALES and production plans for the recently certificated *Twin-Bonanza* call for 100 of these executive transports to be built between now and the end of 1952, providing world conditions permit such construction. Customer orders with deposits are on hand for more than a year's production of the plane. The *Twin-Bonanza* is powered by two Lycoming engines developing 260 hp at 3400 rpm. Its normal cruising speed (using 65 per cent of power) is 190 mph at 10,000 feet; its fuel consumption at that cruise is slightly more than 25 gph; and its range (maximum) is 982 miles.

List price of the plane, completely equipped except for radio installation, is $44,950 f.a.f., Wichita, Kansas. +++

TWIN-BONANZA is a six-place medium-range executive transport, and is newest in the Beech Aircraft stable of executive planes: Twin-Beech, *Bonanza*, and now *Twin-Bonanza*. *Twin-Bonanza* easily can be converted to a cargo plane



Aerial Braille

Jet pilots of 86th Fighter-Bomber Wing learn blind flying by doing

By S/SGT. S. E. TURNER

The day was foggy. Not just misty, or hazy, but one of those typical Bavarian winter days when the whole world is covered by a cold white veil that reaches from nothingness above to cling and swirl about the half visible ground.

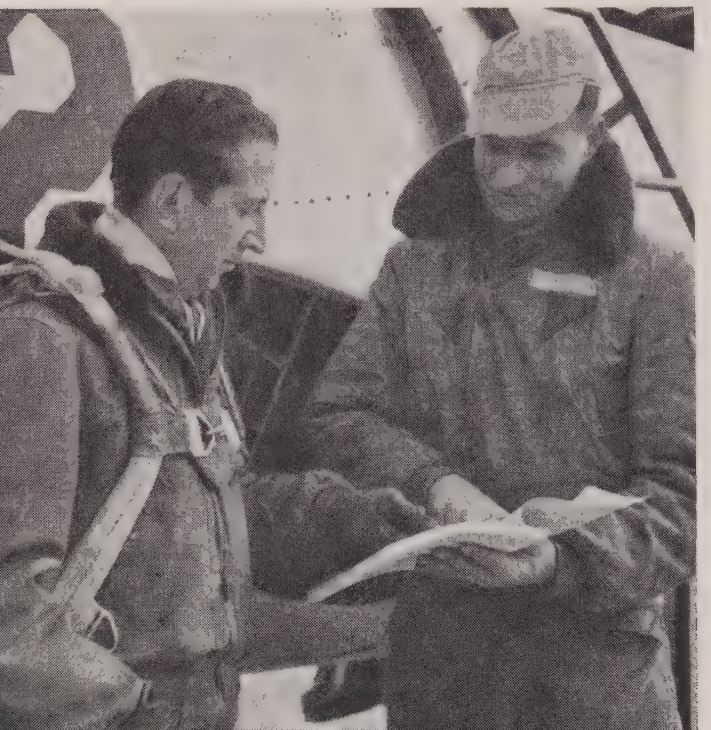
Above Neubiberg Air Base, home of the 86th Fighter-Bomber Wing, the faint thunder of a jet engine drifted raggedly down through the fog, grew in volume, then quickly faded as a plane passed and continued on its course.

Unknown to many, the occupants of that plane were in the process of making local history. But what is more important, they were completing another step toward one of aviation's oldest goals—the preservation of human life. And, as an added incentive, each was learning to save a very important life—his own. In short, the occupants of that plane were "attending school." And the course they majored in was entitled, "How to save my life and my ship when visibility is zero."

Five thousand feet above the airfield, the student pilot skillfully maneuvered the T-33 two-place jet trainer through a wall of fog that limited vision to less than 150 feet. With him was a "blind flying" instructor, ever watchful for that moment when an alert action might mean the difference between life and death.

Every maneuver possible under foggy or other inclement weather conditions was executed by the sole aid of instruments, then rehearsed and repeated . . . steep turns, climbing and descending turns, unusual positions. Next came use of the invaluable radio compass. "Homing in" on the two Air Force radio towers located off the base, the student brought the jet directly over the end of the runway; then at a signal from the instructor, he pulled the ship up in a deliberate "missed approach" and climbed again to cruising altitude.

This time they tried "tracking and homing" (flying a predetermined heading or track by use of the radio compass). Then, checking and rechecking with the radio beam from the base located somewhere below the white wall, the student "blind-flying" pilot practiced solving 180° ambiguity, an operation by which time, direction, and distance



CHECK—Capt. Williams *(left)* goes over operating details with Sgt. Pinkston. Know-how adds to confidence

EXPERIENCE—Capt. Grey *(in cockpit, above)* gets set for take-off for blind-flying experience with student, Capt. Peterson. Capt. Grey *(below)* shows how to get home despite fog. Aluminum poles represent guiding radio aids

LET-DOWN—Air Force F-84E, high above its fogged-in field in Bavaria, starts its let-down through overcast

from the home station are determined.

"Ready for the chute let-down?" asked the instructor when all maneuvers and problems performed by the student had satisfied his critical eye.

"Ready."

The chute let-down technique is probably one of the most valuable of all inclement-weather procedures. The pilot, bearing in on two short-wave radio stations located at known intervals outside the base and directly in line with the runway, maneuvers the plane into an aerial "trough," the bottom end of which is directly over the end of the landing strip. Then, as the pilot, using only radio range signals for "vision," brings the ship in line with the runway and passes over the second radio signal tower, "control" is taken over by GCA whose operator "talks" the plane down by observing its course in the GCA scope, and giving vocal instructions to the pilot by radio until he is close enough to the ground to complete the landing himself, usually an altitude of about 50 feet if the fog is really heavy.

This time it was a little over 50 feet when the twin rows of approach lights rose up out of the fog and the outlines of the strip began to take form.

The instructor pilot took over, guiding the ship in on the field.

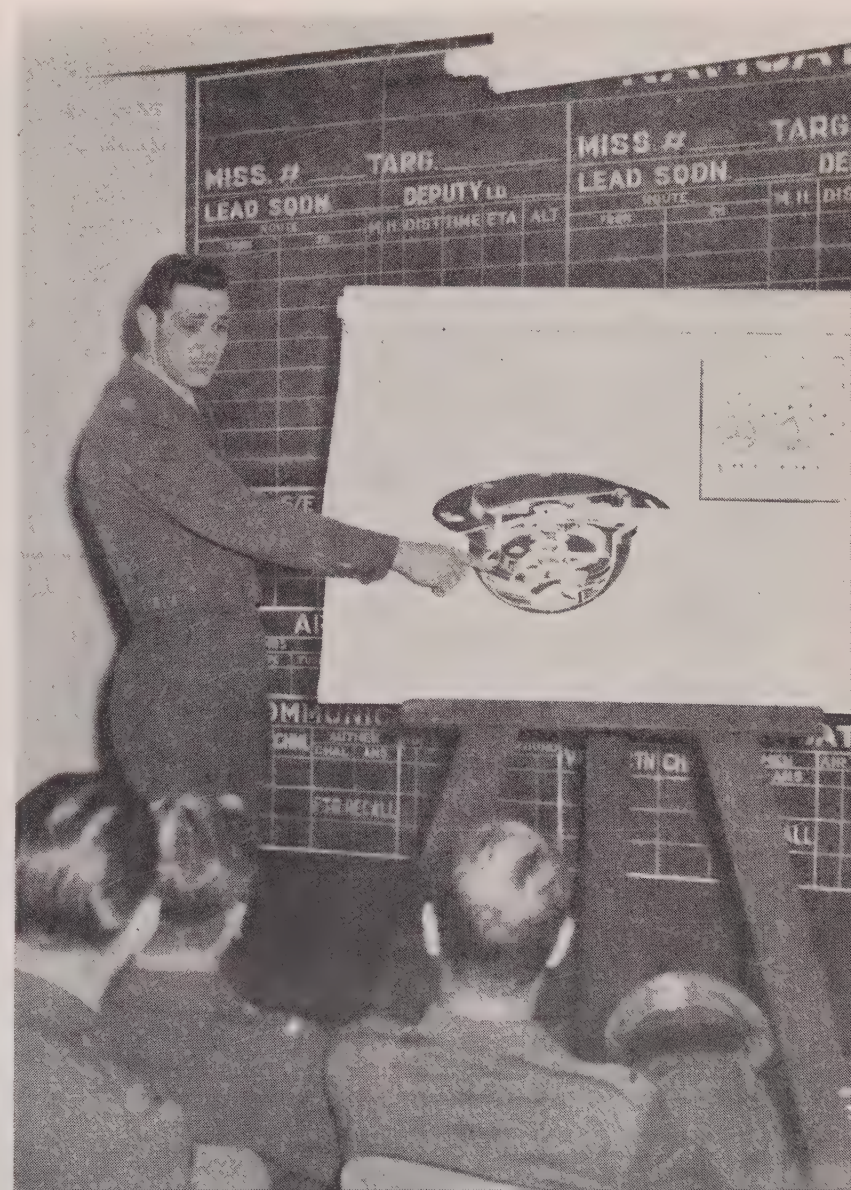
"7257 to GCA. I can see the runway now."

"OK, 7257, take over visually."

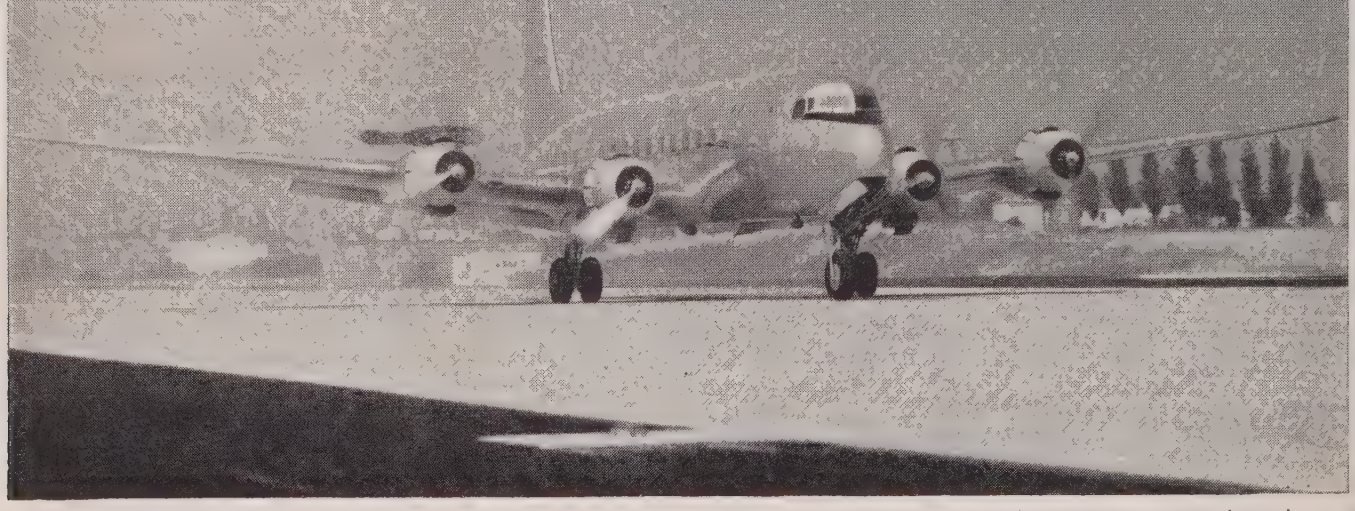
The jet settled swiftly upon the concrete top, braked to a stop at the far end of the runway and bellowed off down the taxi strip to halt in front of a nearby hangar. Another skirmish against flying's oldest enemy had been won.

The first efforts toward instituting the 86th Fighter-Bomber Wing's initial blind-flying course began in the early part of November, 1950, when the first class, under the instruction of Capt. T. T. Williams and assistant instructors, was set up for the purpose of saving lives and equipment which too often were sacrificed to Bavaria's eternally unpredictable weather.

The first course, scheduled to last two to three weeks, was an overnight success on the base. The class was split into "A" and "B" sections so that planes were continually in the air while ground classes were in session. Subjects selected for use included stiff courses in (*Continued on page 55*)



GROUND SCHOOL—Good ground training makes for safer air work. Here, Capt. Wagner explains instrument mechanism



TAKE-OFF—Captain throttles forward to 54 in. Hg; First Officer follows suit. DC-6 breaks ground at 95 Indicated

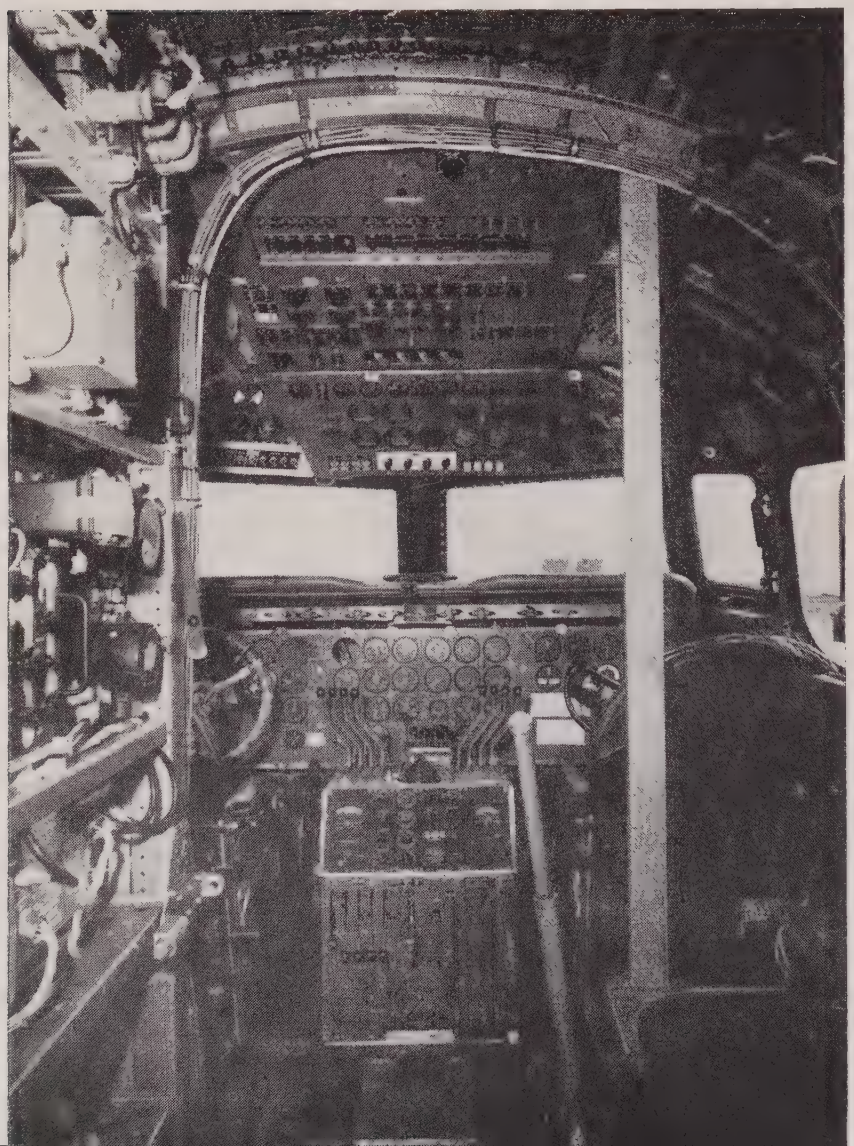
Up Front in a "Six"

By LEN MORGAN

You're looking at the business end of an airliner—the cockpit of a Douglas DC-6, the plush, high-stepping pride of 16 world airlines. Unless your work takes you to the flight decks of big airliners, you may size up the cockpit as a hopeless conglomeration of dials and gadgets and wonder how anyone could learn to control it.

Three men of suitable qualifications can read the dizzying rows of instruments and manipulate the array of controls and switches with breath-taking results. They can bring this 45-ton luxury liner to life and cause it to lift itself and its cargo from a runway into thin air. At their expert command, it will pitch through the cold reaches of the substratosphere at 440 feet per second and seek out, with electronic instinct, a fog-bound target 2,000 miles away. Whether or not the crewmen can see where they are going has nothing to do with the precision of their task, except for a minute or so at each end of the flight. What's more, the same three men can repeat the entire amazing process by day or night, in any season or weather to any place on the globe, and carry it off with timetable regularity. Such is the miracle of today's scheduled air transportation.

Invite a passenger into the cockpit from his comfortable reclining seat in the cabin and he will invariably ask two questions as he gazes at the dials and knobs: 1) What are they all for? 2) How can you possibly



FRONT OFFICE—Despite complex appearance to layman, cockpit of DC-6 is well-ordered; pilots call it "one of the best plane instrument panel layouts"

keep track of all of those instruments at once?

There are over 400 separate controlling or indicating devices in the DC-6 front office, depending upon who owns the airplane. Each airline has its own ideas concerning the type and arrangement of cockpit equipment. This accounts for the slight differences to be noted between the set-ups of a United *Mainliner 300* and an American *Flagship*. And the figure 400 does not include the panel of some 150 circuit breakers not shown in the pictures accompanying this article.

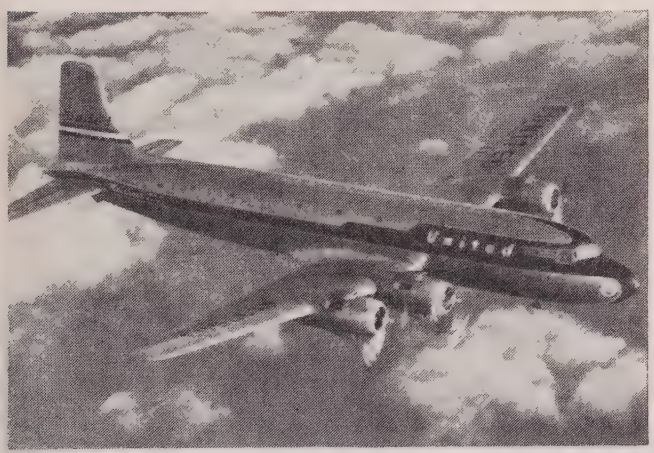
Is all this equipment absolutely essential in getting a "Six" off the ground? Actually, it's not. Conceivably, one pilot could fly the ship, using only *six* of the controls—wheel, rudders and throttles—and *none* of the instruments. That is, he could take it off, fly it for a limited time in clear weather, and then land it. He would have no knowledge of engine operation and only a rudimental control over the engines. He would have no idea at all about the workings of the plane's many component systems, no communication with the ground or other aircraft, no accurate system of navigation and no means of maintaining a precise course through the air. It *could* be done but a flight made under such conditions would be an erratic, unsafe affair which might result in major internal damage to the airplane.

If you're going to fly a "Six" anytime, anywhere, and in every kind of weather—which is exactly what the airlines do—then the services of three properly trained and experienced men are needed for the job. And to do the job right, meaning dependably and safely, they will require an intimate knowledge of everything going on in the machine and outside of it. This is where the gadgets come in.

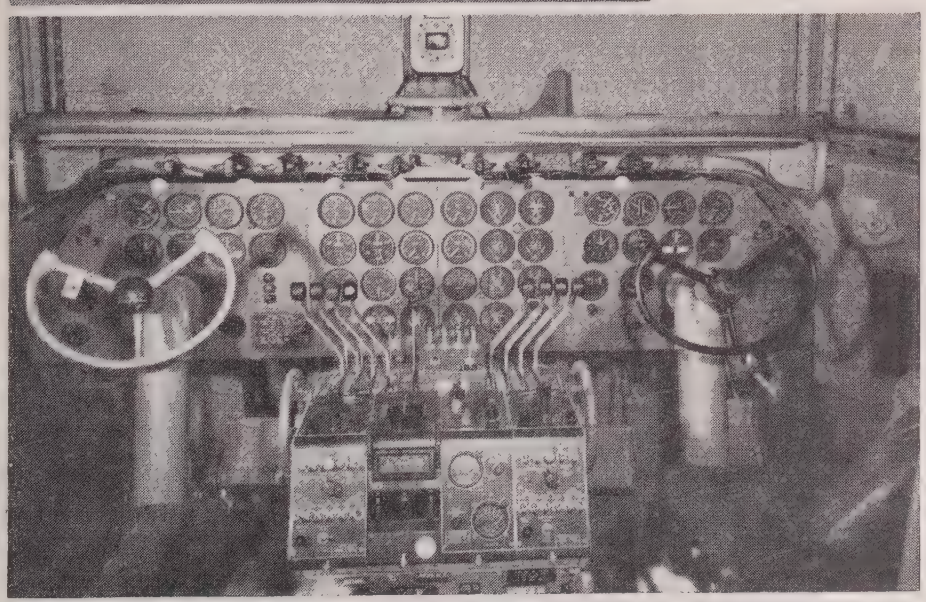
In spite of the outward complex appearance, the cockpit of the DC-6 is a well-ordered affair, one of the best among large aircraft. Controls and instruments are systematically grouped according to their individual functions and relative importance. An entire department of the Douglas plant devoted considerable time and money to making this flight deck as *un*complicated as possible. From a pilot's point-of-view, a simpler arrangement would be difficult to imagine.

Take the flight instruments, for example, or "flight group" as it's known to the trade. The primary function of any aircraft is, of course, to fly. Flight instruments make accurate flight possible regardless of what can or cannot be seen through the windshield. The flight group is located right in front of the Captain, and it consists of a sensitive altimeter, gyro horizon, directional gyro, indicators to show rate-of-climb, turn-and-bank and airspeed, and a clock. These are the most important instruments in the cockpit. When "on instruments," the Captain refers to them continually in much the same way a motorist scans the road ahead. An identical flight group faces the First Officer's seat, not merely for convenience but to provide a method of cross-checking the instruments themselves. ILS and radio compass indicators (which are required in the over-all process of weather flying) are located nearby, plus various subsidiary valves and gages which have to do

(*Continued on page 46*)



AIRLINER — Each airline has own ideas concerning arrangement of cockpit equipment. There are few differences between United's layout and American Airlines' DC-6 set-up



INSTRUMENTS—Controls and instruments are systematically grouped according to function and importance. Flight group is in front of the Captain; engine gages in center

MARINE CORSAIR comes in for landing on Navy carrier in Korean waters. Pilot is Marine airman who used to fly transports with MAG-33

New to the "U" Bird

By CAPT. HUBARD KUOKKA, USMC

TRANSPORT PILOT Capt. Penn made the switch from transports to fighters; has flown about 50 fighter missions

Marine transport pilot with Air Group 33 swaps transport for a Corsair, now fights the Commies from flattop near Korea

PILOTS aboard Navy carrier head for their *Corsairs* and new strike against Communist ground forces

CORSAIRS supply close support to U.N. ground forces. The sheet of flame to right came from Napalm dropped by F4U

No longer can the Marine fighter pilots accuse Captain Les Penn of Hot Springs, Arkansas, of trying to be a square peg in a round hole. He can show them where he shaved off the edges.

Penn is a transport pilot, and a good one, too. But when the Korean War started, he wanted to get into it with a Leatherneck fighter outfit.

Unfortunately, he was completely inexperienced in *Corsair* fighting. Up until the latter part of June he had never flown a "U" bird, as the F4U was called, from a carrier deck, nor had he made any gunnery runs in it.

But he was persuasive as well as determined. A little more than a month later when the "Death Rattlers" squadron catapulted off a jeep carrier on its first strike against the Communists in Korea, Penn was with the boys.

"When I was shot off for that first strike, my plane was staggering with a full load of bombs, rockets and machine gun ammo," he said. "I had never fired any of them before. In fact it was the first time I'd ever flown the 'U' bird with such a load."

Major Arnold Lund of Flagstaff, Arizona, the quiet and friendly skipper of the squadron, kept his fingers crossed. He hoped he had made a wise decision in letting Penn join his squadron.

When the Marines were ordered to Korea, the Major had been given free rein and barely a week to build up a combat squadron from the most experienced and best qualified carrier-fighter pilots at the Marine Corps Air Station at El Toro, near Los Angeles. Although several squadrons were ready to go, it was Major Lund who was given the priority to build up his outfit from a peacetime skeleton strength to operate from a mobile air base, a jeep carrier.

At that time Penn was the transport pilot attached to Marine Air Group 33.

"Major, I'd sure like to go with you," Penn said as Major Lund came by to interview pilots.

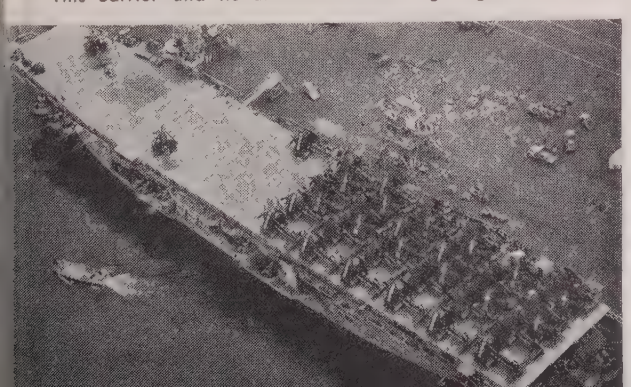
Major Lund laughed. Almost every pilot in El Toro was begging to go along. But he was concentrating on getting fighter pilots highly trained in close air support work with the Marine ground forces during the intervening years. Some of his flyers had 150 carrier landings to their credit. On such a team of all-stars Lund did not want a novice like Penn creaming himself on the deck of a tiny flattop.

Penn's persistent requests became a daily affair. He did everything but get down on his hands and knees to beg to be taken along. He told the major his qualifications.

At the beginning of World War II he had been trained as a transport pilot but had flown dive bombers for a very short time. Then he wound up as an aviator attached to the Marine ground forces as a forward air observer. He directed pinpoint air strikes on enemy targets at Iwo Jima and Okinawa. After the war he was aide to Major General Ralph Mitchell, and then went back to flying transports.

When he was ordered to duty as assistant operations officer in MAG-33 at El Toro, he saw his opportunity to learn to fly fighters. On his own, sitting in the cockpit with a pilots' (*Continued on page 48*)

FIGHTERS' flown by Marine pilots get ready for take-off (*above*) for strike against Korean Reds. Air view (*below*) shows *Corsairs* being loaded aboard *USS Badoeng Straits*. This carrier and its airmen are now fighting the Commies



Civil Air

A full-fledged auxiliary of the Air Force, CAP celebrates 10th birthday

Armed Forces Day 1951 found the Civil Air Patrol, a full-fledged civilian auxiliary of the U. S. Air Force, nearing its 10th anniversary. Today, the Civil Air Patrol is in operation wherever there are airports and airmen in the United States, Alaska, Hawaii and Puerto Rico—52 CAP Wings in all, with more than 75,000 active members. The national organization's part in Armed Forces Day observances by no means is the only time CAP comes in for alliance with the Air Force. Almost daily, somewhere in the States or the Territories, the Air Force's Air Rescue Service calls in CAP planes and pilots for search duty. For this type mission CAP flyers are reimbursed for fuel and oil expenses.

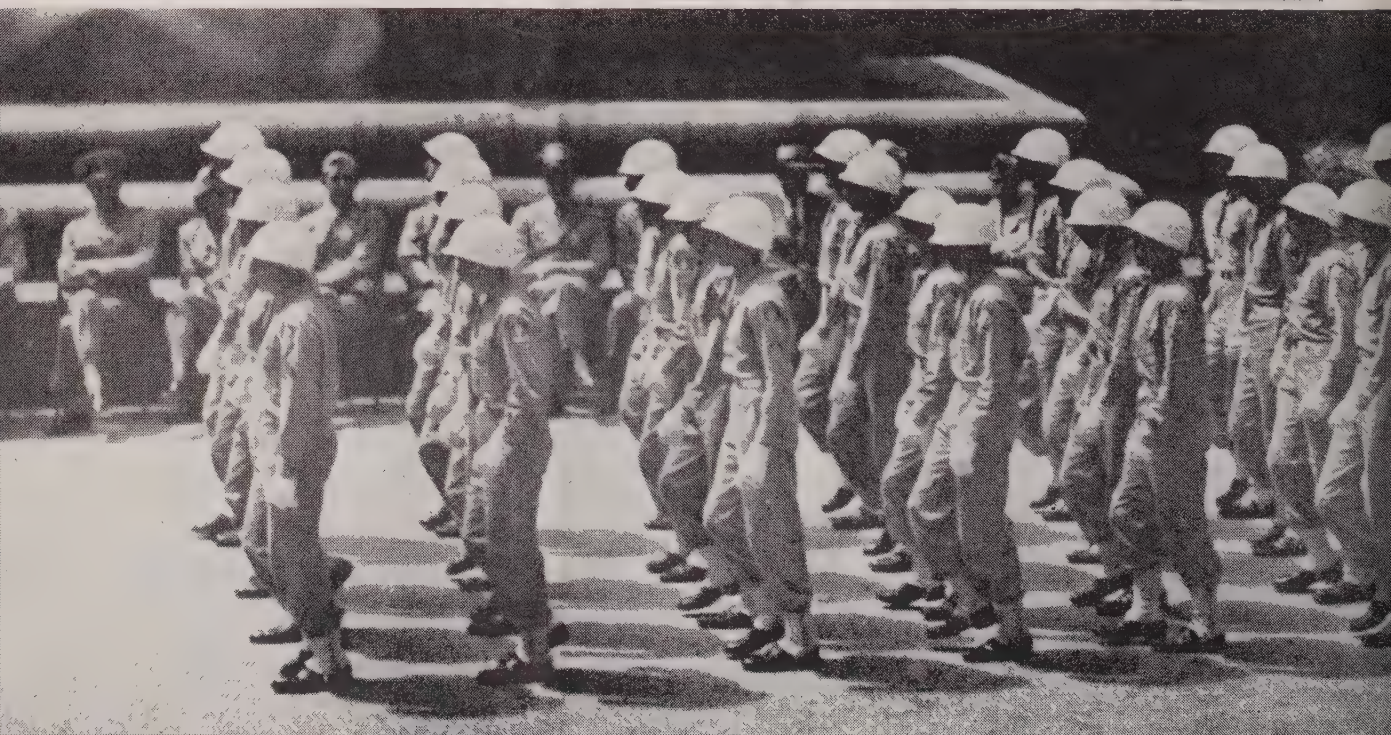
Where search and rescue is concerned, the job is a big one for CAP. The record shows that more than 70 per cent of ARS missions are helped by the CAP, its volunteer manpower and equipment. In some cases Air Rescue gives the auxiliary the green light to conduct a search alone. Generally the "week-end pilots" are not long in finding their lost man.

But "volunteer" is the word for it where Civil Air Patrol is concerned. From the top CAP'er to the youngest cadet in the Patrol, all are volunteers. Gen. Carl A. Spaatz, USAF (Ret.), chairman of the National Executive Board in CAP, is as much an "air volunteer without pay" as the 15-year-old CAP cadet who joined up with the local unit today.

What, then, makes CAP a going concern in aviation?

NAT'L COMMANDER of Civil Air Patrol is Major General Lucas V. Beau of the USAF

CAP INSTRUCTOR shows cadets *(right)* proper way to spin prop. Civil Air Patrol goal is to train 100,000 cadets. Today, there are more than 30,000 boys and girls in the CAP



Patrol's 10th

By LT. HAROLD B. NELSON, USAF

CHAIRMAN of the CAP's National Executive Board is Gen. C. A. Spaatz, USAF Ret.

"Enthusiasm" may be the answer. Enthusiasm and the inherent love for the air which Americans possess. Another factor in CAP's decade of success is the "positive" attitude of the military. In recent years the Air Force has adopted the organization for purposes of aid and affiliation, but without actual appropriation.

The USAF part in Civil Air Patrol comes in the form of a National Headquarters for the organization, commanded by Maj. Gen. Lucas V. Beau (USAF), a complete staff of officers similar to that of any Air Force headquarters, and a USAF field liaison officer and small staff assigned to each wing of CAP. Through this framework of professional airmen, Civil Air Patrol receives constant advice and administrative assistance with which to carry out its assigned missions.

Perhaps at the top of CAP's list of missions to perform for aviation and the USAF is the assigned goal of 100,000 trained CAP Cadets. More than 30,000 boys and girls presently swell the ranks of the organization. Their ages are between 15 and 19 years—a nucleus of potential airmen for the ranks of CAP seniors later on, and an air-minded citizenry for the United States generally.

Cadetship in Civil Air Patrol does not dismiss the youth's obligation to possible military draft and service. The same goes for senior members of the Patrol whose ages may make them liable to military service. As a matter of fact, as seen through the USAF Indoctrination Center at (*Continued on page 45*)

EXCHANGE program calls for reciprocal training on international exchange basis. Here, cadets get glider training in Switzerland. Drill contests are run between U. S., Canada

Give 'em a JET

Navy airmen go for jets; prefer them for their speed and ease of handling

PRE-FLIGHT—Before climbing into his *Panther* at NAS, Floyd Bennett Field, Lt. Cmdr. Sam Parsons *(above left)* checks plane's battery system, guns. Once in the jet fighter *(below)*, he is "buttoned-up" by plane captain

CONTACT—Assistant plane captain throws energizer switch for engine start while plane captain gives the pilot the "contact" signal. With his oxygen mask on and everything in order, pilot follows Line Chief's taxi signs

on't ever stop a jet pilot and ask him whether he likes his jet better than the old prop-driven aircraft because you'll be a long time a'listen-g. Jet pilots really like their planes. And they can ve you plenty of reasons why.

For instance, they'll tell you that the new planes e much easier to fly, mainly because they're less mplicated. They'll tell you that jet flying is more easant—there's no vibration and little noise. And ey'll say definitely that flying the jet takes less ergy. Finally, the jet can cruise or climb just out as fast as any pilot wants it to.

Lt. Charles K. Signor, USNR, is one ex-combat lot who is impressed by the jet's speed. He says, never really realized how fast those planes could avel until I listened in on some F-86 *Sabres* which re clearing from El Paso, Texas, for March Field, lifornia, at about 1700 one night. Now that's a od 500-mile hop. But these guys were giving their A as only an hour later. Of course, the beauty the whole thing is that when they got there it uld still be only 1700."

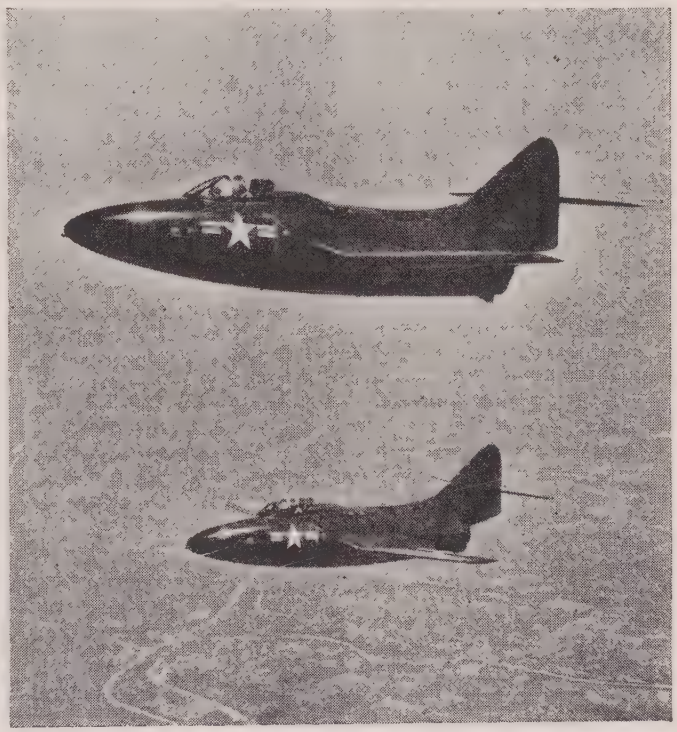
So, cruising speed the jet planes do have. What out rate of climb?

Lt. Herbert Childs, attached to VF838, the all-ather squadron at Floyd Bennett Field, N. Y., can you. He remembers the second jet hop he ever w. He took off behind his flight leader in a *antom* and kept his eye on the leader's tailpipe ile they climbed up and to the left. A few seconds er Childs had hauled up his gear and raised his os, he glanced down at his altimeter. It read 00 feet.

Childs shook his head. He thought they'd hit 4,000 feet pretty fast. But when he looked over the side, he said to himself, "That can't be right." And it wasn't. They were at 14,000!

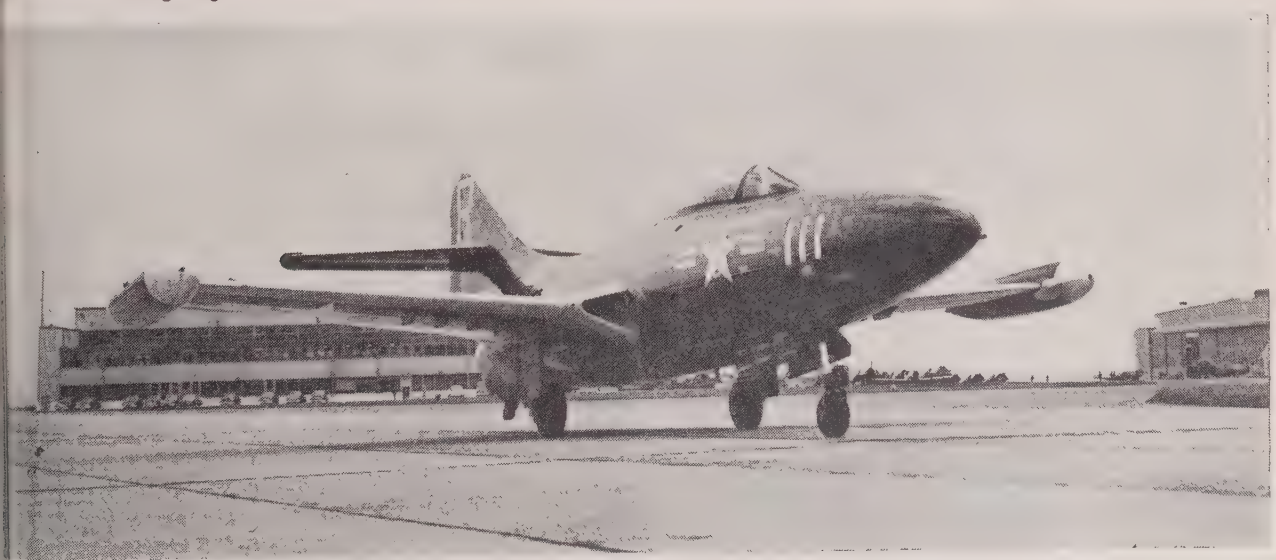
But it's the ease of operation that really appeals to most pilots. Ease of operation that's built in. Since the jet has no prop, there's no torque. With torque counted out, engineers didn't have to build in wing warp, nor rudder offset to compensate for that wing warp. So there's (*Continued on page 54*)

By ELIOT TOZER



GHT—Longer a jet pilot can operate at high alti- and high throttle setting, the greater the range

KE-OFF—Lt. Cmdr. Parsons taxis the *Panther* out for -off on training flight. The F9F gulps fuel on the ground, cuts plane's flight endurance. To reduce fuel consumption, jets often are towed to take-off position



HANGAR FLYING

New Record

A new world record for prop-driven aircraft recently was set by Jacqueline Cochran when she flew her F-51 *Mustang* back and forth across an officially certified straight-away 16-kilometer course for an average speed of 469 mph. Of the seven recognized world speed records for different distances in the open class for prop-driven planes and a like number of jets, Miss Cochran now holds five of these records for the prop planes.

Youngest Pilot

It is doubtful that anyone will argue with 11-year-old Al Bennett Jr.'s claim for the title of the world's youngest airplane pilot. Al Jr. went to Mexico with his father and while there soloed a Taylorcraft *Sportsman*. Preparatory instruction for young Al's solo flight has been underway for six years. Asked how the solo flight went, Al Jr. replied, "Gee, it was as easy as riding my bike." The young man still has a few years to wait before he can get his pilot's license.

21st Year

Colonial Airlines recently began its 22nd year of scheduled operation without a fatality or serious injury to a passenger or crew member. This sets a new world's airline operation safety record. In the 21-year period of safe operation, Colonial has accumulated 387,933,105 passenger miles, completed an estimated 522,294 landings and take-offs, and carried more than 1,447,227 passengers safely over the 3,182-mile route system running from New York and Washington north to Montreal and Ottawa, Canada, and south to Bermuda.

Radio Questions for Commercial Tix

The CAA has announced that from now on issues of commercial pilot written examinations will include questions on radio "because of the increased importance of radio in aviation." The questions to be asked will be chiefly concerned with: tuning the radio to appropriate frequencies to communicate with ranges and towers for weather info and landing instructions; use of approved methods and phraseology for communicating with control towers and airway stations; and use of omniranges for navigation and use of four-course LF ranges for determining fixes by beam intersections and quadrant identification.

The Flying Club

Civil Aeronautics Administration has published a booklet on the organization and operation of flying clubs. Called *The Flying Club*, the booklet contains chapters on reasons for flying clubs, how to organize one, the cost of flying under the flying-club scheme, plus helpful and practical hints on the operation of clubs. The booklet sells for 15 cents and is obtainable from Superintendent of Documents, U.S. Govt Printing Office, Washington 25, D.C.

New York Map

Pilots wishing copies of the new 1951 New York State airport map and directory may get them by writing to the New York State Department of Commerce, 112 State Street, Albany 7, N. Y. This map lists a total of 318 landing facilities, including 49 municipally owned airports, 10 military fields, 207 commercial and private fields, 50 seaplane bases and two heliports. Printed in red and blue, the map measures 21 by 30 inches and shows the location of airports in relation to county lines, principal waterways, cities and villages of 1,000 or more population, and smaller airmarked communities. Airports in adjacent states and Canada (within 25 miles of New York State border) are also shown.

National Air Races

The National Air Races have been definitely set for Detroit this year, according to word from general manager Ben T. Franklin. The races are scheduled for August 18, 19, and the military will participate if the international situation permits. There will be six separate jet events.

Named to CAP

William P. Lear, chairman of the Board, Lear, Inc., and Collier Trophy winner, of Grand Rapids, Mich., has been appointed advisor to the national commander of Civil Air Patrol in the fields of communication and electronics. As an advisor to Maj. Gen. Lucas V. Beau, Col. Lear will provide counsel and guidance to the administration of CAP's short-wave radio network of more than 7,000 stations. Lear's long career in aviation is also expected to be of much value in other areas of the CAP.

News Notes

Ninety-Nines have scheduled their International Convention at Mackinac Island, Michigan, from August 22 to 26.

The 5th Annual All-Woman Transcontinental Air Race (sanctioned by the Ninety-Nines) also has been set for August, the 15 to 19, at Santa Ana, California.

Capital Airlines announced recently that Otto A. Seyferth of Muskegon, Michigan, has been elected a director of Capital Airlines. Mr. Seyferth is President of the U.S. Chamber of Commerce.

CAB Chairman Donald W. Nyrop has been appointed a member of the National Advisory Committee for Aeronautics. He succeeds Delos W. Rentzel, who was named Undersecretary of Commerce for Transportation.

Aircraft Industries Association has named Filliam L. Smith to its staff as assistant to George F. Hannaum, Director of Industry Planning Service.

Aviation Insurance Consultant Jack Galbraith, of Buffalo, N. Y., has announced a 15 per cent reduction in insurance costs for Cessna 170, 190 and other executive type aircraft. Along with reduction in rates there is considerable improvement in hull coverage, insofar as the deductible is now a flat fee instead of a percentage of value.

Lear, Incorporated, announces the election of Paul Moore as Executive Vice President and General Manager.

	Complete Aircraft			Manufacturer's Net Billing Price		
	Shipments			Shipments		
	TOTAL Jan-Mar	March	February	TOTAL Jan-Mar	March	February
				(thousands of dollars)		
Aeronca						
Champion 90 hp	7	1	2			
Sedan	15	5	6	71	20	28
7CCM[a/]	2	--	1			
Beech						
Bonanza	82	30	25			
D-18	19	9	3	2,171	948	456
Bellanca						
Cruisemaster	5	5	N.R.	57	57	N.R.
Cessna						
140A	35	9	14			
170A	82	13	39	999	382	281
190	6	--	--			
195	45	37	2			
Engineering & Research						
G	5	1	1	17	4	3
Luscombe - 8-F	17	4	5	50	14	14
Mooney - M-18	6	.1.	3	12	.2.	6
Piper						
Tandem Trainer	144	44	40			
Pacer	175	84	63	1,060	444	356
Ryan - Navion	91	24	22	1,057	278	253
Taylorcraft						
Sportsman	5	1	3	9	2	5
Texas Engineering						
GC-1B	6	2	2	23	8	8
TOTAL	747	270	231	5,526	2,159	1,410

a/ Military type aircraft sold to other than U.S. Military Customers.
N.R. Not reported

MARCH REPORT from Aircraft Industries Association shows shipment of 270 one to 10-place personal and executive aircraft by 11 companies. Of 270, 207 were four-place or more planes

SKYWAYS MAGAZINE has given me the opportunity of providing a short introduction to their presentation of an "Album of Naval Aircraft."

It has now been more than 40 years since the Fleet "grew wings." There is little similarity between today's jet fighter and the kite-like pusher biplane which made the first shipboard landing on January 19, 1911. Few men of those pioneering days still wear the Navy uniform on active duty.

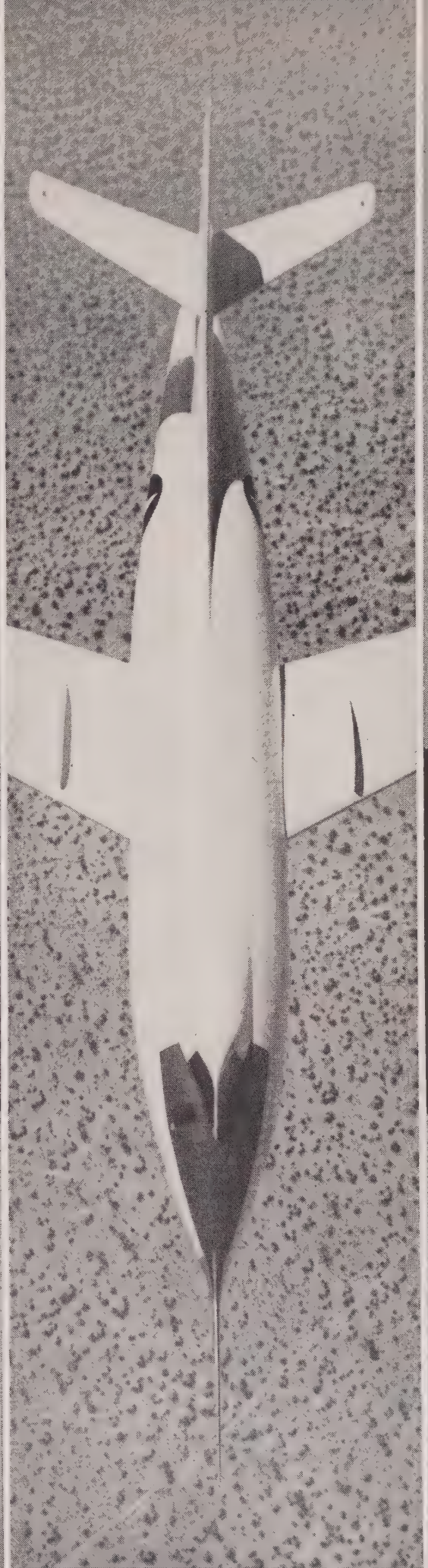
Yet the urge to progress, the willingness to meet whatever challenge may arise—are as keen and fresh today as at any time in the past. Pictured here are the aircraft which provide the eyes, the swift transportation, and the hard, far-reaching striking power of your United States Navy.

In days to come there will be newer planes and different men to crew them. One vitally important element of Naval Aviation will be unchanged—the determination to provide the greatest possible insurance that this nation maintain the freedom of its shores, and the freedom of the seas.

Vice Adm.
Deputy Chief of Naval Ops. (Air)

U.S. AIR NAVY

Special Section



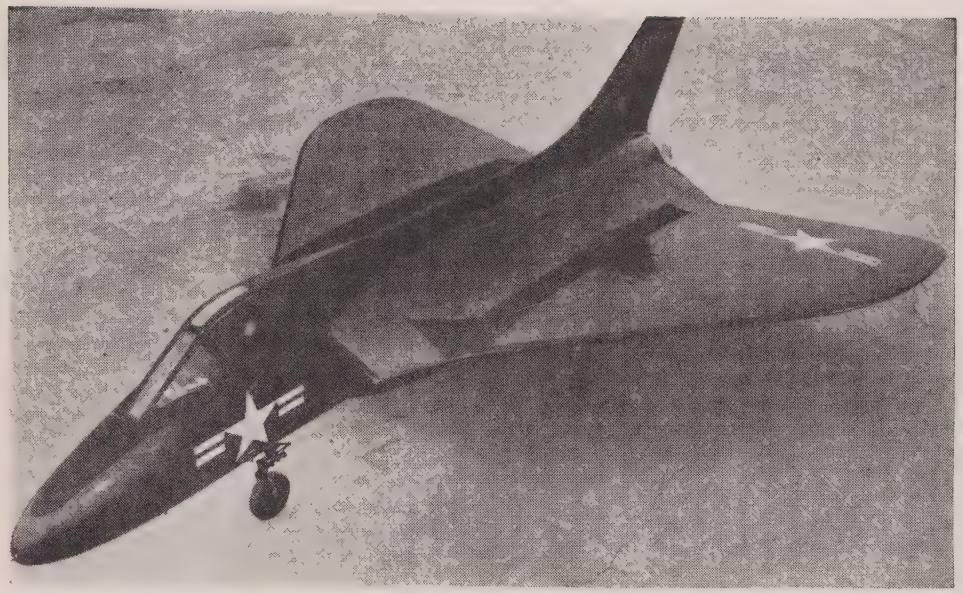
FIGHTERS

CHANCE VOUGHT F4U-5 The famed *Corsair* still is in operational use; this time in Korea where it is providing close support. The '5 model is a night fighter equipped with radar. It is powered by P&W R-2800 engine driving Hamilton Standard Hydromatic prop. Armament includes machine gun or cannon, bombs or rockets. A single-seater, it has top speed over 350 mph.

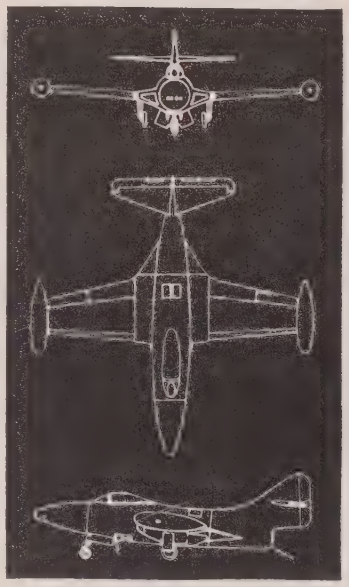
CHANCE VOUGHT F7U-1 Called the *Cutlass*, the F7U-1 is a radical twin-jet tailless fighter powered by Westinghouse J-34W-32 engines, each rated at better than 3,000 pounds thrust. A carrier-based plane, it is a fast-climbing fighter in the "more than 600 mph" class. Instead of an airplane tail section, the *Cutlass* design incorporates two vertical stabilizers and rudders at the trailing edge of the wing. "Ailavators" combine ailerons and elevators to provide longitudinal and lateral control. The *Cutlass* is equipped with slats instead of flaps.

DOUGLAS F3D The *Skynight* is a twin-jet long-range fighter also equipped with special electronic devices for night and all-weather fighting. Powered by two Westinghouse J-34 engines, each rated at better than 3,000 pounds thrust, the *Skynight* is in the "over 600 mph" class. It carries a crew of two: pilot and radar operator. The airplane is adaptable as an attack fighter, long-range patrol or reconnaissance plane, or long-range fighter escort. A novel escape chute opens on the underside of fuselage permits its high-speed bail-out.

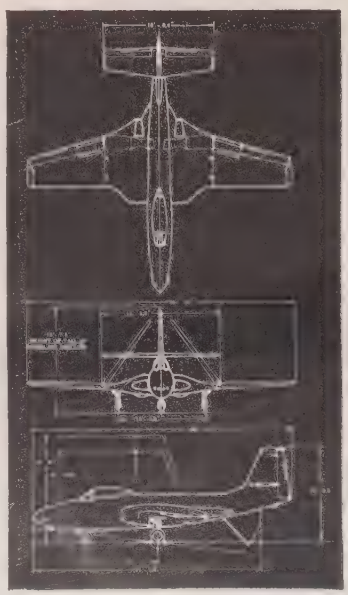
DOUGLAS XF4D Another tailless Navy plane is this experimental jet interceptor developed by Douglas Aircraft. Designed for catapult take-off from carriers and rapid climb to upper atmosphere, the XF4D is a single-seater interceptor employing a swept wing. At the present time all details concerning performance as well as powerplant are restricted. The XF4D is one of the first Navy fighters designed specifically for interception and fulfills the need for a fighter that can intercept the enemy before he reaches a position to attack.



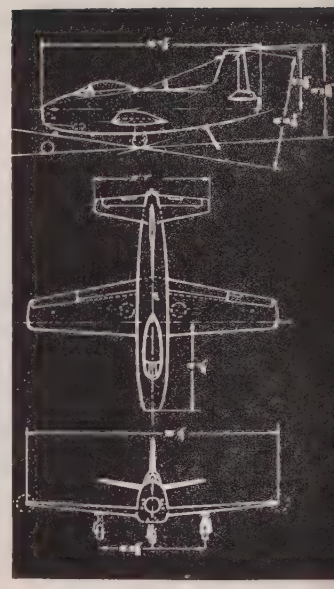
GRUMMAN F9F A carrier-based jet fighter, the *Panther* is another flexible fighter that can also be used as a ground support plane. Powered by a P&W J-42 jet engine rated at 5,000 pounds thrust, the F9F has a speed in excess of 600 mph and range of more than 1200 miles. As a ground support plane, the *Panther* fires 5-inch rockets, 20-mm shells and 500-pound bombs. The F9F is a single-seater with wing span of 38 feet; is 40 feet long and 11 feet 4 inches high. Navy pilots are flying the *Panther* from aircraft carriers off Korea.



MCDONNELL F2H-2 The twin-jet *Banshee* is considered to be one of the most potent twin-jet carrier based fighters the Navy has. It is powered by two Westinghouse J-34 turbo-jets, each rated at 3250 pounds thrust. A single-seater, the F2H-2 has a cruising speed of more than 600 mph, a ceiling of more than 45,000 feet and a range of over 2,000 miles. It has a wing span of 41 feet; is 39 feet long and sits 14 feet high. Armament includes four heavy cannon in the nose. Nose wheel folds to permit a "kneeling" position.

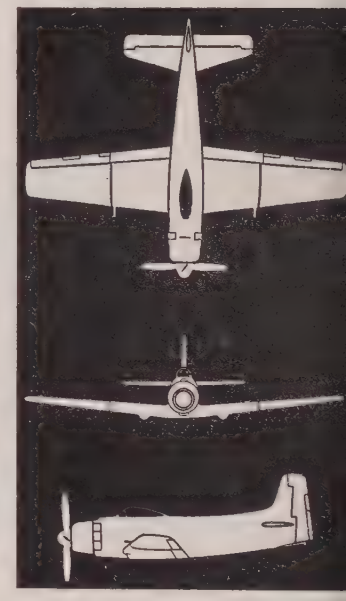


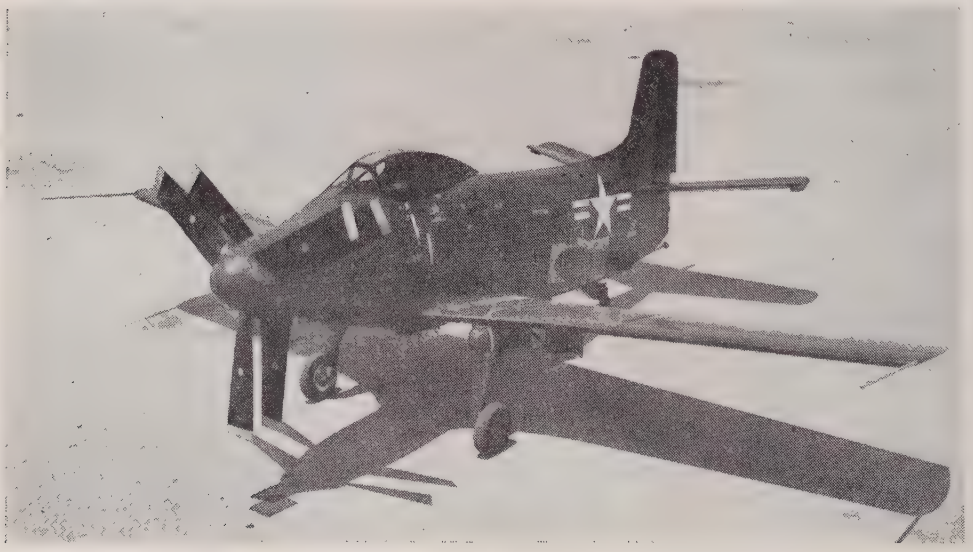
NORTH AMERICAN FJ-1 Called *Fury*, the FJ-1 was first jet plane to carry out operational landings and take-offs aboard a carrier at sea. A single-seater, it is powered by a J-35 jet engine with a thrust rating of 5,000 pounds. It has a speed in excess of 550 mph, and a range of more than 1500 miles (further increased by wing-tip tanks). The *Fury* has a wing span of 38 feet 1 inch; is 33 feet 7 inches long, and has an over-all height of 11 feet 6 inches. Its climb at sea level is better than a mile a minute, and it has a stalling speed of 102.9 mph. Bending nose gear enables it to "kneel down".



ATTACK

DOUGLAS AD The carrier-based *Skyraider* has proved its prowess in Korea where it is providing excellent ground support. Capable of carrying rockets, bombs or torpedoes up to a total of 10,000 pounds, the *Skyraider* packs more wallop than a light cruiser. Powered by a Wright R-3350 engine of 2300 hp, the *Skyraider* has a top speed in excess of 350 mph, a range of more than 1500 miles, and a diving speed of more than 500 mph. Some 18 different versions of this utility bomber have been designed, and one of latest versions of the *Skyraider* under consideration by the Air Navy is jet powered.





DOUGLAS XA2D Called the *Skyshark*, the XA2D is a new Navy attack bomber powered by Allison T-40 twin turbo-prop engine driving two Aeroproducts counter-rotating propellers. Power is further augmented by jet thrust through the tail pipe. Offensive punch of the XA2D is delivered by a variety of rockets, bombs, aerial torpedoes or other weapons carried on external wing racks. Once the plane is airborne, either of the turbines may be cut off to obtain more range.

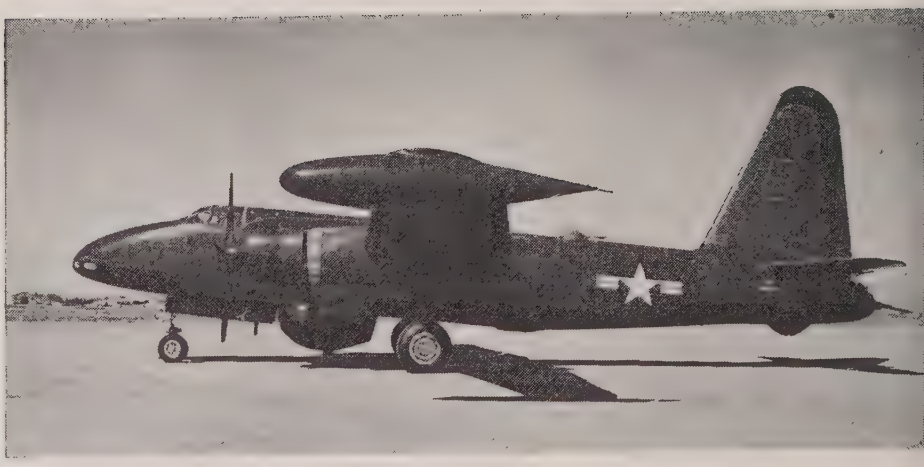
NORTH AMERICAN AJ-1 Very recently named *Savage*, the AJ-1 is a carrier-based attack bomber powered by one jet and two piston engines. The two conventional P & W R-2800 reciprocating engines are located under the wings, and the single Allison J-33 turbojet is mounted in aft section of the fuselage. The P & W's develop 2300 hp each while the J-33 provides an additional thrust of more than 4,000 pounds. Designed for high-speed attack, the AJ-1 has a top speed in excess of 350.

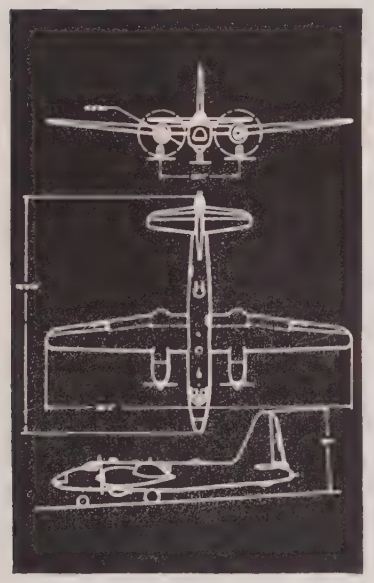
PATROL

CONSOLIDATED VULTEE XP5Y-1 Designed for long-range search and rescue missions, the XP5Y-1 is said to be the world's first turboprop flying boat. Powered by four Allison T-40 turboprop engines, the XP5Y-1 has a top speed of more than 350 mph and it can get off the water in less than 30 seconds. Official designation is R3Y1. Its propellers are Aeroproducts counter-rotating props.

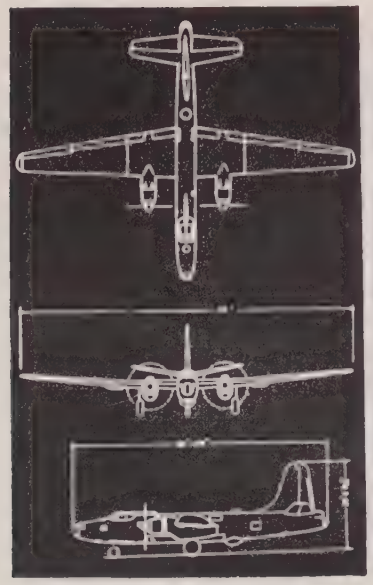
GRUMMAN AF-2S Called the *Guardian*, there are two versions of this single-engine anti-submarine airplane: AF-2S and AF-2W. Used together, these two aircraft make up a deadly "hunter-killer" team. Powered by P & W R-2800 engines of 2300 hp the AF-2S and AF-2W have a top speed in the "over 275 mph" bracket. Said to be the "world's largest single-engine aircraft," the AF-2S and -2W have a gross weight of over 25,000 pounds. The props are Hamilton Standard.

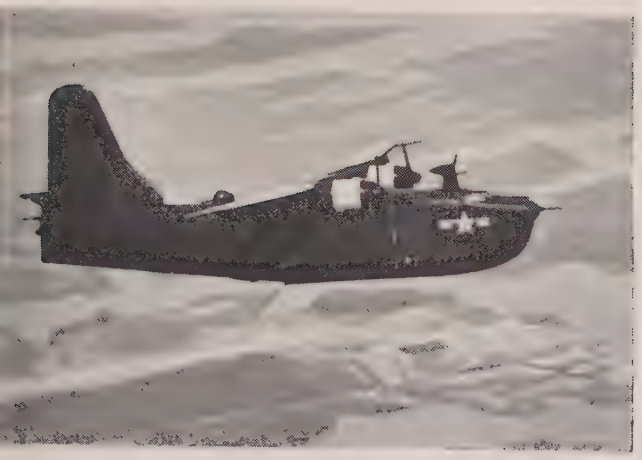
LOCKHEED P2V— Navy's prime anti-sub plane, the *Neptune* is powered by two Wright R-3350's, each developing 3,250 hp. The P2V-4 *(right)* and P2V-5 *(below, right)* are same except for nose turret, larger wing-tip tanks, more radar in P2V-5. Carrying a crew of from four to nine, the *Neptune* has top speed of 315 mph. Three-view drawing shows P2V without tip tanks.



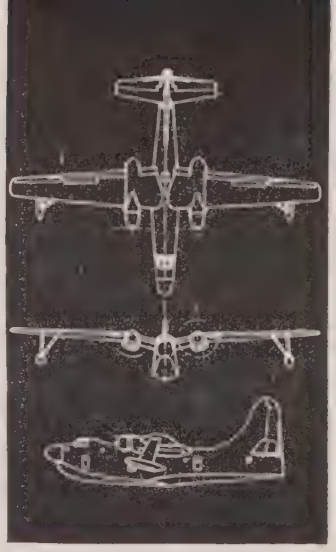


MARTIN P4M-1 The *Mercator* is one of the Air Navy's long-range patrol bombers. Carrying both P & W *Wasp Majors* and Allison J-33 jet engines, the *Mercator* has a top speed of just under 400 mph and a range of more than 2,000 miles. Carrying a crew of nine, the *Mercator* is armed with mines and guns weighing more than 14,000 pounds.





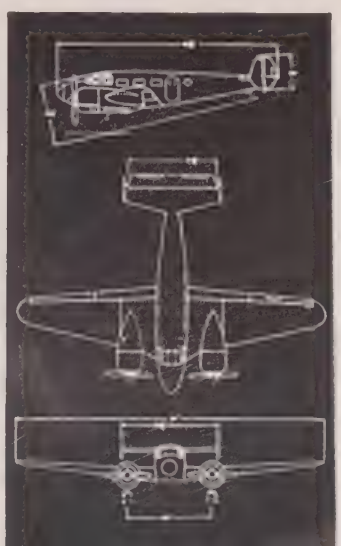
MARTIN P5M-1 Another anti-sub plane, the *Marlin* is a flying boat that carries a crew of seven and is powered by two Wright R-3350 compound engines, each rated at an estimated 2700 hp. Feature of the *Marlin* is new type hull in which keel is under water from nose to tail, providing more stability on the water. The *Marlin* is 94 feet long and is a development of the PBM-5 *Mariner* of W.W.II.



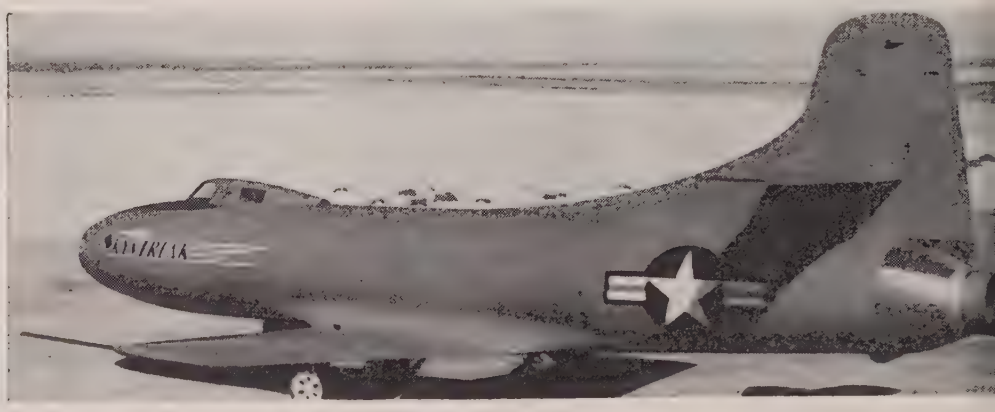
Special Purpose

BEECH 50 Called the *Twin-Bonanza*, this plane is being considered by all three branches of the service: Navy, Air Force and Army. Carrying pilot, co-pilot and four passengers, the *Twin-Bonanza* has cruising speed of 191 mph, a normal range of 935 miles at 10,000 feet and 65 per cent power. It is powered by two Lycoming GO-435 engines, each rated at 260 hp at 3400 rpm at sea level.

BEECH SNB-4 Reconditioned for today's Navy service, the Twin Beech is both a trainer and a liaison plane. Powered by 450-hp P & W engines and Hydromatic props, the SNB-4 has a top cruising speed of 211 mph at 75 per cent of power at 10,000 feet. It has a range (depending on quantity of fuel, altitude) of from 735 miles to 1400 miles.



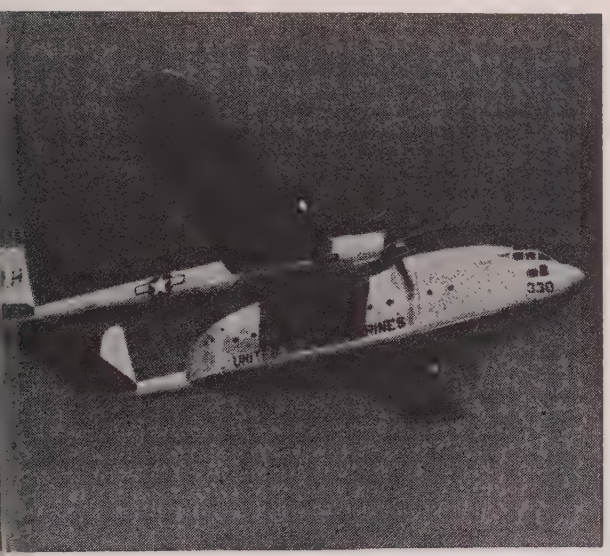
DOUGLAS D-558 The scarlet-red *Skystreak* is one of the Navy's sonic-speed research aircraft. It is powered by a GE TG-180 turbojet engine of 5,000 pounds thrust and it has a design speed of 650 mph. The *Skystreak* has a gross weight of 9,750 pounds and a wing loading of 65 pounds per square foot (wing area: 150 square feet). For the pilot's protection, in the case of a bail-out, the entire nose is jettisonable.



DOUGLAS D-558-2 A jet-rocket research aircraft, the *Skyrocket* is a single-seater like the *Skystreak*, but it is powered by a Westinghouse 24C jet engine and an RMI rocket motor. Some reports credit the *Skyrocket* with a design speed of more than 1800 mph. However, the Navy claims it is a speed-of-sound aircraft (761 mph at sea level and 663 mph at 35,000 feet). It has 25-foot wing span; is 44 feet 7 inches long.

DOUGLAS R4D This is the Navy's version of the twin-engine "ole faithful" DC-3, now modernized into military version of the new Super DC-3. These design changes will double its range, add 50 mph to its speed and raise its useful load by 50 per cent. Powerplants are two P&W 1830 (1050 hp) engines and they drive Hamilton Standard propellers. It has wing span of 90 feet (5 feet less than original DC-3), an over-all length of 67 feet 8½ inches (3 feet longer than DC-3) and the vertical stabilizer is 18 feet 3 inches high. Its weight is 31,000 pounds.

DOUGLAS R6D Navy's four-engine transport is this military version of the Douglas DC-6A. It is powered by four P & W R-2800-CB17 engines which develop 2500 hp (take-off) each with water-alcohol injection, and 1900 maximum continuous horsepower. Normal cruising speed is in the 300-mph range. The R6D has a wing span of 117 feet 6 inches and an over-all height of 28 feet 8 inches. Its fuselage is 105 feet 7 inches long. Interior of the R6D has structural provisions for troop benches or hospital litters, and air cargo tie-down rings.

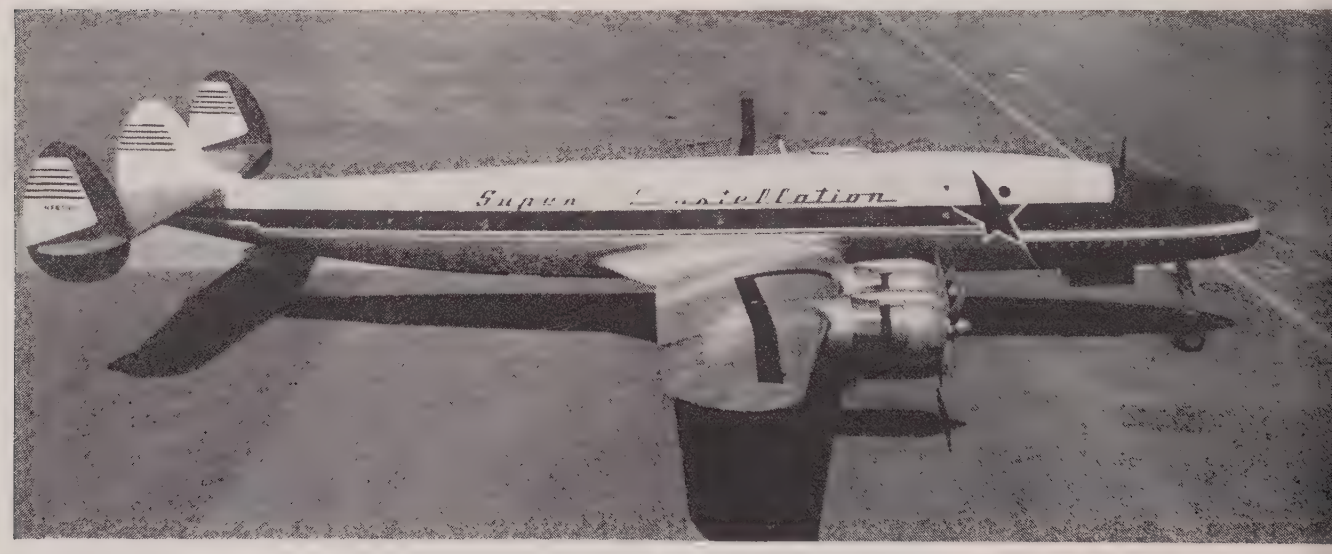


FAIRCHILD R4Q This is the Navy version of the Air Force's C-119 *Packet*. It carries a crew of five and has facilities for 42 to 78 passengers. Powered by two P & W R-4360 engines of 3,250 hp (take-off) each, the *Packet* has a speed in excess of 250 mph and a ceiling of more than 30,000 feet. It has a combat radius of 1100 miles. Wing span of the R4Q is 109 feet 3 inches; is 86 feet 6 inches long and 24 feet 4 inches high. R4Q is one of USMC's mainstays.

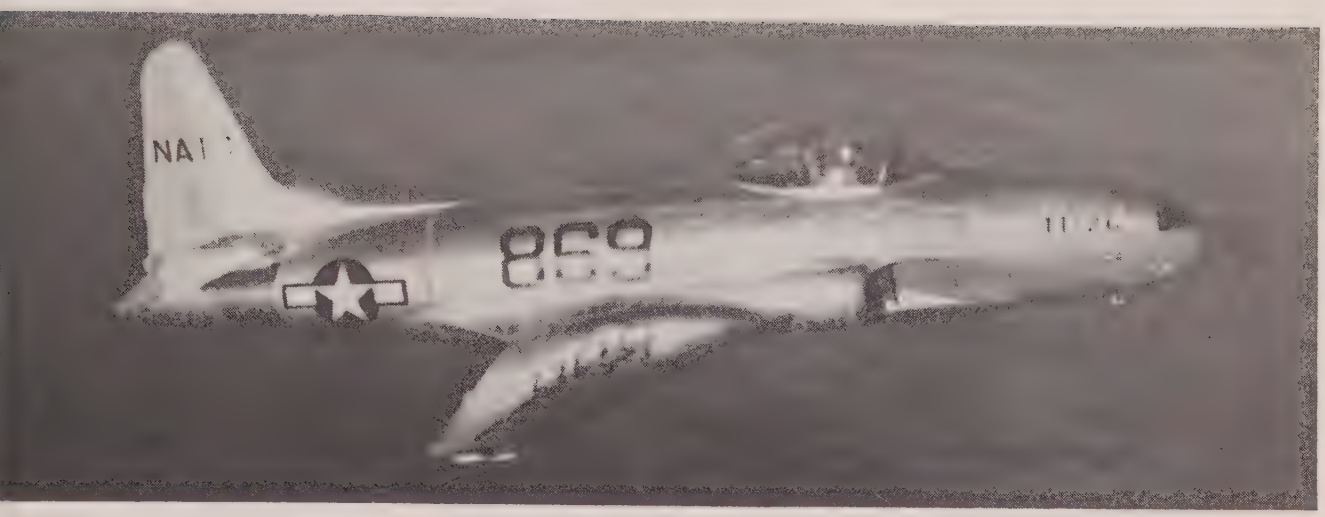
GRUMMAN UF-1 The *Albatross* is one of the Navy's rescue planes (Air Force SA-16). Powered by two Wright R-1820 engines, each with a take-off rating of 1,425 hp, the *Albatross* has a speed of 257 mph, a ceiling of 26,000 feet and a normal range of 2700 miles. It has a wing span of 80 feet, a length of 60 feet 7 inches, and it sits 24 feet 4 inches high. In addition to pilot and co-pilot, the *Albatross* can carry from four to six passengers. The UF-1 has a fuel capacity of 675 gallons, with an additional 600 gallons in an auxiliary tank. UF-1 is in service in Korea.

LOCKHEED PO-2W A flying laboratory, the Navy's PO-2W is the electronically equipped airplane that extends the eyes of the Fleet. Carrying early warning radar gear, this version of the Connie provides a defense against both low- and high-altitude attack planes. The bulky external radome atop the plane contains powerful radar antennae. It is powered by four Wright 2650-hp normal engines, cruises at 300, has a ceiling of 27,800 feet.

LOCKHEED R70 Called the *Super Constellation,* this big transport is 18.4 feet longer than its predecessor and has more powerful engines (18-cylinder Wright compound engines producing a total of 13,000 hp). The bigger engines provide longer range, greater carrying capacity. The Super Connie has a cruising speed of 340 mph and a range of just under 4,000 miles. Wing tip tanks can be carried to further extend the Super Connie's normal range.



LOCKHEED R60 The *Constitution* is the Navy's double-decker transport that carries a crew of 12, plus 168 passengers. Powered by four P & W R-4360 engines of 3500 hp each, the R-60 cruises at 240 mph and has a range of 1200 miles with maximum payload of 40,000 pounds. The R60's top speed is 303 mph and its ferrying range is 5,000 miles. It has a wing span of 189 feet 1 inch. Props are Curtiss Electric four-bladed, with the two inboard props reversible. The Navy air giant has a fuel capacity of 10,000 gallons.

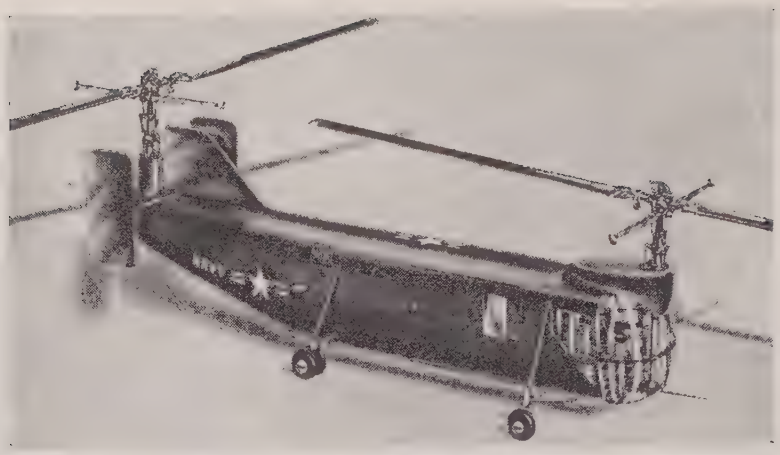


LOCKHEED TO-1 This is the Air Navy's trainer version of the famed F-80. Powered by an Allison J-33 engine of more than 5200 pounds thrust, the TO-1 has a speed in excess of 600 mph and a normal range of 1,470 miles. It has a service ceiling more than 45,000 feet and a gross weight of 15,336 pounds. The TO-1's wing span is 38 feet 10 inches, is 37 feet 8 inches long, and sits 11 feet 8 inches high. It has a fuel capacity of 755 gallons.

HELICOPTERS

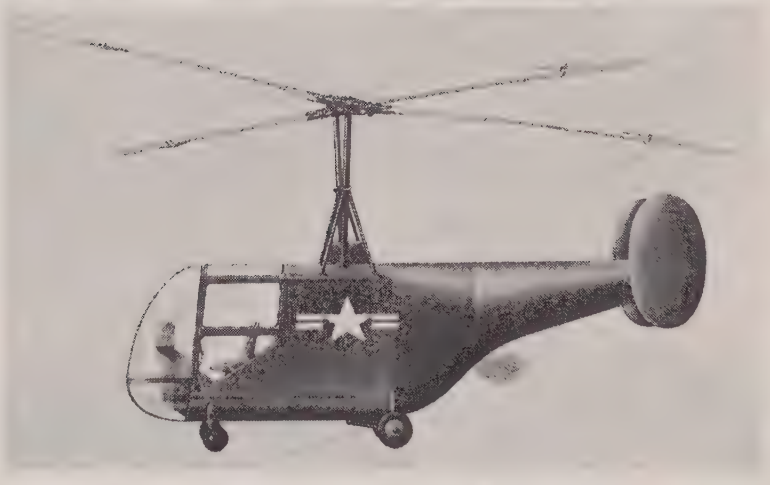
BELL HTL-3 In use by both the Navy and the Marine Corps, the HTL-3 seats a pilot and two passengers. It is powered by a Franklin O-335 engine rated at 200 hp (take-off). The 'copter has a top speed of 98 mph, cruises at 85 mph and has a normal range of 210 miles. It has a hovering ceiling of 7600 feet and an absolute ceiling of 15,500 feet. The HTL-3 has a gross weight of 2,350 pounds.

BELL HTL-4 The HTL-4, like the HTL-3, seats a pilot and two passengers. It is powered by a Franklin O-335-5 engine that has a take-off horsepower rating at sea level of 200 (at 3100 rpm). The HTL-4 has a fuel capacity of 11 gallons and a normal range of 151 miles. The Franklin engine gives the HTL-4 a top speed of 93 mph and a cruising speed of 78 mph (at sea level). It has an initial rate of climb of 960 fpm at full gross weight of 2,086 pounds. HTL-4 has a hovering ceiling of 7600 feet and an absolute ceiling of 15,500 feet. HTL-4's in production for the U. S. Navy.



BELL XHSL-1 First helicopter to be specifically designed for anti-submarine warfare, the XHSL shown here is an artist's conception. Bell was awarded an initial contract for three. Tandem-rotored, the 'copter is powered by a P&W R-2800 engine. The fore and aft rotors are inter-connected. Although a departure from the familiar Bell single-rotor configuration, the XHSL incorporates the basic Bell rotor system principles, particularly the rigid two-bladed rotors themselves and the patented automatic stabilizing device.

HILLER HTE-1 This is the Navy's version of the Hiller commercial 360 'copter developed by Hiller Helicopter. A three-placer the HTL-1 is powered by a Franklin 6V4 engine with a take-off horsepower rating of 178 at 3,000 rpm. It has a top speed of 84 mph, a cruising speed of 76 mph, and a normal range of 210 miles. It has an absolute ceiling of 11,000 feet and an initial rate of climb of 745 fpm at gross weight 2400 pounds. The HTE-1 has a main rotor diameter of 35 feet.



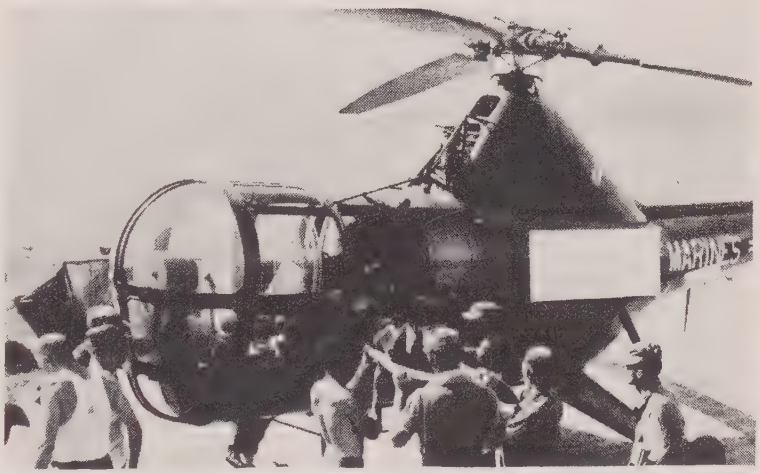
KAMAN HTK-1 This is a two-place training type helicopter powered by a 240-hp Lycoming engine. This 'copter utilizes the same type of intermeshing rotors and servo-rotor controls which have characterized Kaman helicopters since their inception. The Navy has awarded Kaman a production contract for both the HTK shown here and the HOK-1 liaison helicopter which is similar to the HTK but which carries a pilot and three passengers. All other HTK figures are restricted.

MCCULLOCH MC-4 A new two-place helicopter, the MC-4 is a tandem-rotored 'copter powered by 165-hp standard horizontal aircraft engine. No anti-torque device is required. The MC-4 has an operating speed (sea level, on 75 per cent power) of 85 mph, a service ceiling of 16,000 feet and a hovering ceiling of 6,000 feet. It has a range at operating speed of 260 miles and a landing speed, power off, of 30 mph. The cockpit arrangement provides side-by-side seating. It has gross weight of 1800 pounds.

PIASECKI HUP-1 Ordered by the Navy for shipboard service, the HUP-1 is a relatively high-speed and fast rate-of-climb helicopter powered by a Continental R-975-34 engine rated at 525-hp for take-off. The HUP-1 normally carries a crew of two and five passengers. With installation of a Sperry autopilot, the HUP flies "hands off" in all flight attitudes. One of the main uses at the HUP-1 is for plane guard duty ('copter follows flat-top while planes are taking off, assuring rescue in event of ditching).

PIASECKI HRP-2 Navy's transport helicopter is the HRP-2, a refinement of the HRP-1, the so-called "Flying Banana." A feature of the HRP-2 is the side-by-side pilot seating. Intended primarily as a "mercy-mission" 'copter, it is aptly called *Rescuer*. Navy specifications for the HRP-2 call for eight passenger seats, plus pilot and co-pilot. However, better than double that load can be carried in short-haul operation at overload weight. Fuselage is all metal.

SIKORSKY HO3S A military version of the S-51, the HO3S is called "guardian angel" by the soldiers in Korea where it is shuttling back and forth from combat area to base hospital. Both the Navy and Marines are using the HO3S for rescue work. Powered by P & W R-985-B4 engine rated at 450 hp (take-off, sea level), the HO3S has a cruising speed of 85 mph at 1,000 feet, and a range of 276 miles. It has a hovering ceiling of 5,000 feet; absolute ceiling of 14,500.



SIKORSKY HO4S-1 The Navy's version of the S-55, the HO4S-1 is also in service in Korea (undergoing, for the most part, operational service tests). Larger than the HO3S, the HO4S is powered by P & W R-1340 engine with a normal rated horsepower of 550. It has a cruising speed of 86 mph, a hovering ceiling of 9,000 feet and an absolute ceiling of 16,500 feet. Carrying a crew of two, it has facilities for eight or 10 passengers. It has a top speed of 110 mph and a normal range at cruising of 477 miles.

U. S. Air Navy Plane Facts and Figures

Mfg.	Desig.	Type	Crew	Powerplant	Horsepower or Lbs Thrust	Speed	Ceiling	Combat Radius or Range	Span	Length	Height
Beech	SNB-4	Training, Transp.	2/6	(2) P&W Wasp Jr.	450 hp (NR)	211 mph Cr	20,500	1100 mi	47′7″	33′11″	.....
	Model 50	Transp.	1/2	(2) Lycom GO-435-C2	260 hp T/O	190 mph Cr	20,400	1005 mi	45′3⅜″	31′6″	11′4″
Consol.-Vultee	R3Y-1	Transp.	7/8	(4) All.* T40	4050 hp	350 +	.....	.....	.....	.....	.....
Douglas	AD	Attack	1/3	Wright** R-3350-26WA	2300 hp (NR)	350 +	.....	1500 +	50′	38′10″	15′7″
	XA2D	Attack	1	All.* XT-40	.....	.....	.....	.....	50′	.....	.....
	F3D	AW Fighter	2	(2) West. J-34	.....	600 +	.....	.....	50′	50′6″	16′1″
	R4D	Transp.	3	P&W 1830	1050 hp	226 mph Cr	.....	1425	90′	67′8½″	18′3″
	R6D	Transp.	5	(4) P&W R-2800-CB17	2500 hp T, O	270 mph Cr	.....	.....	117′6″	105′7″	28′8″
	D-558-1	Research	1	GE TG-180	5000 lbs	640 +	.....	.....	25′	35′9″	12′1½″
	D-558-2	Research	1	West. 24C-plus 1-Rocket motor	3000 lbs 6000 lbs	720 +	.....	.....	25′	44′7″	11′6″
Fairchild	R4Q	Transp.	5	(2) P&W R-4360	2650 (NR)	265	.....	.....	109′3″	86′6″	26′3″
Grumman	UF-1	Rescue	4/6	(2) Wright 1820	1275 hp (NR)	257 (max)	.....	2700	80′	60′7″	24′4″
	AF-2S(2W)	Anti-Sub	4	P&W R-2800	2300 hp T/O	275	.....	.....	60′8″	.....	.....
	F9F-2	Fighter	1	P&W J-42	5000 lbs	590	.....	1200 +	38′	38′1″	11′4″

Lockheed	P2V4	Patrol	4/9	(2) Wright** R-3350	2300 hp (NR)	315 (max)	21,700	4200	100′	77′11″	28′1″
	P2V5	Anti-Sub	9	(2) Wright** R-3350	3250 hp T/O	.....	.....	.....	100′	77′11″	28′1″
	PO-2W	Radar-Warn Airborne	6	(4) Wright R-4360	2650 hp (NR)	300 mph Cr	27,800	5100	123′	116′2″	26′2″
	R60	Transp.	12	(4) P&W R-4360	3500 hp	240-280 Cr	.....	1200	189′1″	156′1″	50′4½″
	TO-1	Trainer	1	All. J-33	5400 lbs	600 +	45,000 +	1345	38′10″	37′8″	11′8″
Martin	P4M-1	Anti-Sub	9	(2) P&W R-4360 (2) All. J-33	3250 hp 4600 lbs	300 +	30,000 +	2000 +	114′	86′2″	.....
	P5M	Anti-Sub	7	(2) Wright** R-3350	.....	.....	.....	.....	118′	94′11″	35′2″
McDonnell	F2H-2	Fighter	1	(2) West. J-34	3250 lbs	600	45,000 +	2000 +	41′7″	40′2″	14′6″
North American	AJ-1	Attack	3	(2) P&W R-2800 (1) All. J-33	2300 hp 3900 lbs (NR)	350 +	.....	.....	71′3″	.....	.....
	FJ-1	Fighter	1	All. J-35	5000 lbs	550 + Cr	.....	750 + CR	38′1″	33′7″	11′6″
Chance Vought	F4U-5	Fighter	1	P&W R-2800	2300 hp	350 +	40,000 +	750 + CR	40′11¾″	34′6½″	14′9¼″
	F7U	Fighter	1	(2) West. J-34-WE-32	3000 lbs	700 +	.....	500 + CR	39′	40′	.....

*—Turboprop engine

**—Compound engine

P&W—Pratt & Whitney

All.—Allison

West.—Westinghouse

Lycom—Lycoming

CR—Combat Radius

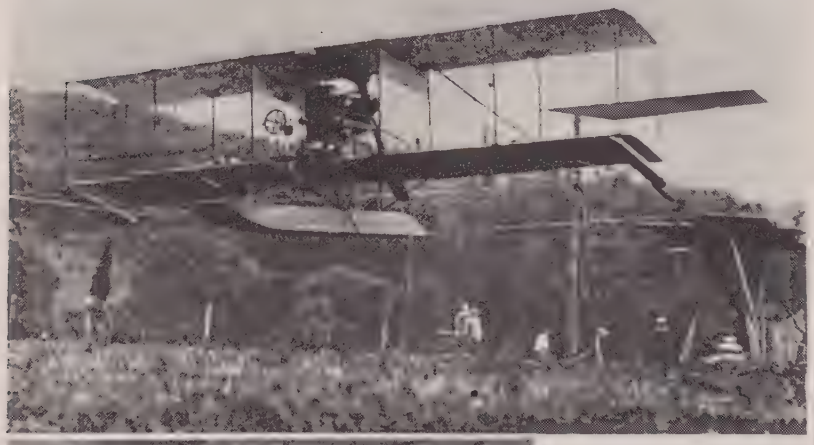
Cr—Cruising

T/O—Take-off

NR—Normal Rating

Air Navy's 40th

NAVAL AVIATION celebrated its 40th Anniversary last May 8. Clad in blue uniforms, white hats, crewmen of the *USS Coral Sea (above)* spelled out "40 years" on the flight deck of the huge carrier in tribute to the birth of U.S. Naval Aviation in 1911

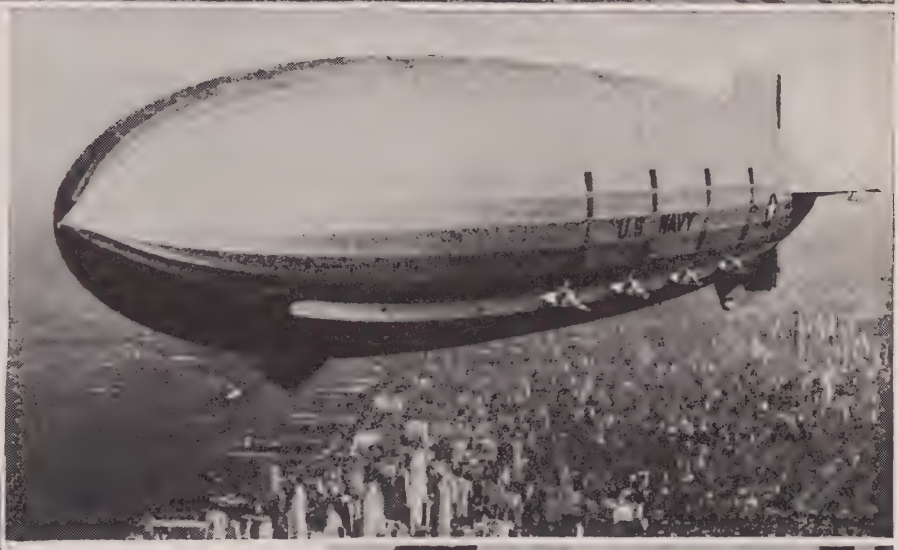


CURTISS TRIAD *(left)* was one of the Navy's first aircraft. This photo shows an experimental cable launching taking place at the Curtiss factory near Hammondsport, N. Y. It is from this beginning back in 1911 that U.S. Naval Aviation has grown

FLYING BOAT *(right)* was first airplane to fly across the Atlantic Ocean. The Navy's famous NC-4 is shown here cruising in harbor at Lisbon on May 29, 1919 after flight from United States

FIRST Naval officer to be designated as Naval Pilot was Lt. T. C. Ellyson *(holding control wheel)*. Ellyson is shown here instructing Lt. John Towers who became Navy Pilot No. 3

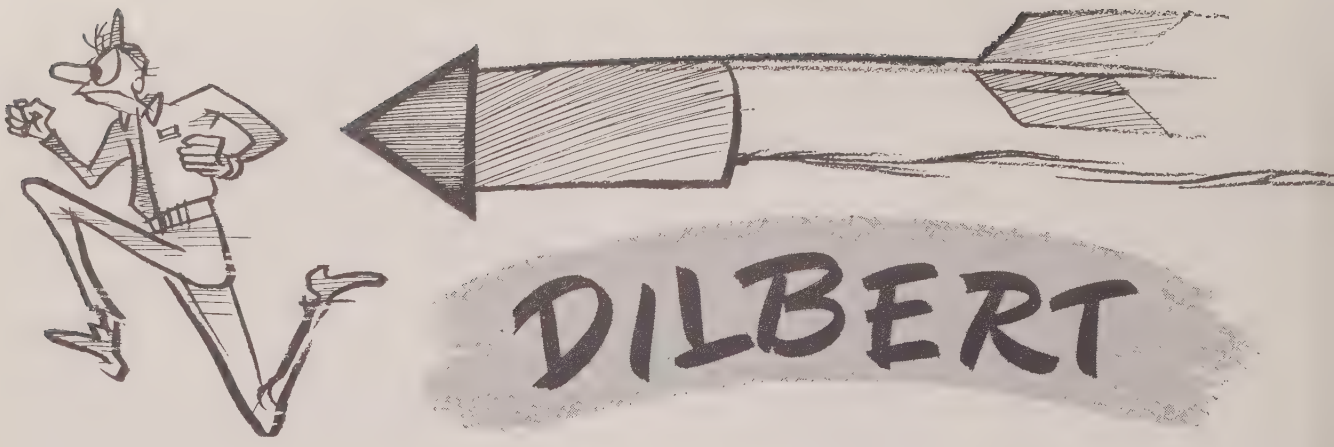
FIRST PLANE to land on the deck of the Navy aircraft carrier *USS Saratoga (above)* was piloted by Lt. Cmdr. Marc A. Mitscher. Landing was made on January 11, 1928. Mitscher later became famous as commander of Pacific Task Force that fought the Japanese in W.W. II



BLIMP that was one of the Navy's largest and most famous of rigid airships was the *USS Macon*, shown here in a flight over lower New York City in 1933. The dirigible served as flying hangar for scout-observation planes that took off, hooked on during flight

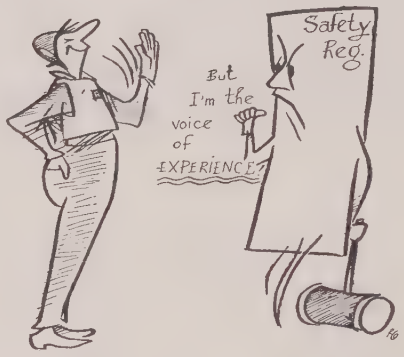
TODAY, Navy's airplanes are bigger, faster and more potent. This carrier-based F4U *Corsair (left)* is shown firing Navy's latest anti-tank rockets called "Rams." This *Corsair* is one operating against Commies in North Korea

ORDNANCE MEN aboard a flattop in Far East are shown wheeling a rack of rockets into position for loading on Grumman *Panther* jet fighters and Douglas *Skyraiders* on the flight deck. It's a far cry from Air Navy today, that of 1911



By S. H. Warner and R. Osborn

Better Be Careful Than Sorry—People in aviation who are careless about safety instructions sooner or later end up in trouble. Don't let "He doesn't have a leg to stand on" be said about you because you didn't follow safety instructions.



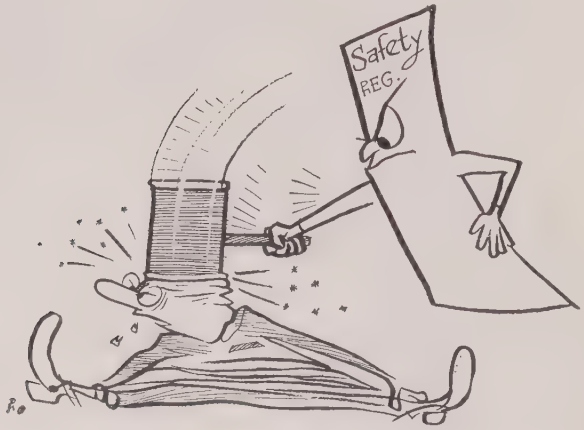
Certain safety instructions may appear childish to you; you have seen them violated often without anybody getting hurt. But that isn't the point. The point is that some people have been hurt when those instructions were not observed. Regulations and safety instructions are the outgrowth of billions of hours of flight experience. They are based on the demonstrated limitations of both personnel and material. F'instance:

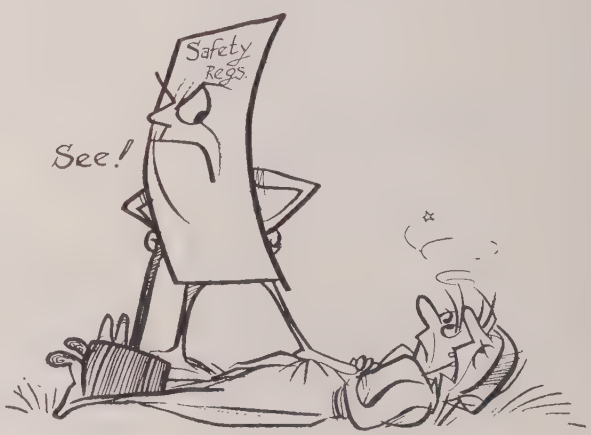
Dilbert had a high-powered, single-engine government-surplus job of which he was very proud. It was a bit old-fashioned, to the extent of requiring a hand crank to start the engine, but Dilbert said it always took him places and brought him back.

One day when he was going to a place, he had two mechs help him get started: one on the starter crank and the other manning the fire extinguisher. The engine failed to fire on the first try, and also on the second. So they decided to pull the prop through by hand. One of the mechs yelled, "Switch off." Dilbert turned off the ignition switch and repeated back, "Switch off." Note how everything had been done according to Hoyle so far, but keep noting. Dilbert had turned off the ignition switch, but he failed to turn the *battery* switch off. He was far from being the first man to neglect this—and it seldom causes trouble, but . . .

In this case the starter engaging toggle was binding a bit, so the spring did not retract it completely. Thus, although the starter was disengaged, the booster ignition coil, which is activated by the same toggle, was not disengaged.

Even this need not have (*Continued on page 52*)





"Dilbert's the goon who pulls his gear up too soon"

CAOA REPORT . .

CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminating legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary to bring about improvements in aircraft equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 1025 Connecticut Avenue, Washington 6, D. C.

New Members

During the past few weeks the following members have been accepted by the directors of the Association:

Turner Halsey Company, textile sales agents, New York City, operates a twin Beechcraft, which is owned jointly with the Mt. Vernon-Woodberry Mills, Baltimore. The chief pilot is Ray F. Moulton.

The Hunkin-Conkey Construction Company of Cleveland has operated aircraft in connection with its heavy construction business since 1946. The present airplane is a de Havilland *Dove,* the first DH to be included in the CAOA fleet. Bruce L. Mathis is the pilot.

William H. Black of La Jolla, California, (aviation office, Del Mar) is in the petroleum production business and operates a Beechcraft D-18-S. William E. Murray (ATR) and Carl F. Elliot (ATR) are chief pilot and pilot.

H. C. Price Company, pipe-line constructors, Bartlesville, Oklahoma, operate a fleet of airplanes, including a Douglas DC-3, two Twin Beeches, and a Ryan *Navion* 260. J. B. Harshman is Vice-President, and the pilots include L. L. McMillon (chief pilot), Jack N. Neal and C. Shaw.

Swiftlite Aircraft Corporation, New York City, a subsidiary of Cities Service Company, is a non-profit organization rendering air transportation to the executives and key personnel of Cities Service Company and its subsidiaries. F. K. Foster is Vice President of the organization and George C. Pomeroy is chief pilot and general manager. Cities Service is one of the earliest users of company planes, and its present fleet is largely composed of Douglas DC-3's, Lockheed *Lodestars,* and Beechcraft 18's.

Lane Construction Corporation, Meriden, Conn., is engaged in large-scale general contracting and operates a Beechcraft D-18-S. The airplane is based at Rentschler Field, East Hartford, and the pilot is David M. Harris. Robert T. Turton is secretary and assistant treasurer of the corporation.

New Uses for Directory

CAA's Air Route System Traffic Control section, headed by Bert Moore (see *Navicom,* page 62) is exploring the possibilities of making definite recommendations for changes and additions in the next revision of the CAOA *Directory of Executive Aircraft.* These would not only result in general improvement for identification purposes, etc., but are directly aimed at increasing its utility in traffic control, navigation and communications procedures coming into effect with the implementation of the SWG-5 program.

As we go to press no final results can be announced, but among the useful suggestions which are being explored are the followin (1) In the data for each aircraft, unc "Radio Equipment," instead of showing detail the manufacturers' models and des nations, the specific L/MF and VHF cha nels available would be shown. (2) For co venience in filing en route flight plans a to cut down on the overburdened commu cations system, each aircraft in the directo might be assigned a call code. For examp "Republic Steel 31" would represent Repu lic Steel Corporation's Lockheed PV N-3031, with complete details (if require available at the flick of a page.

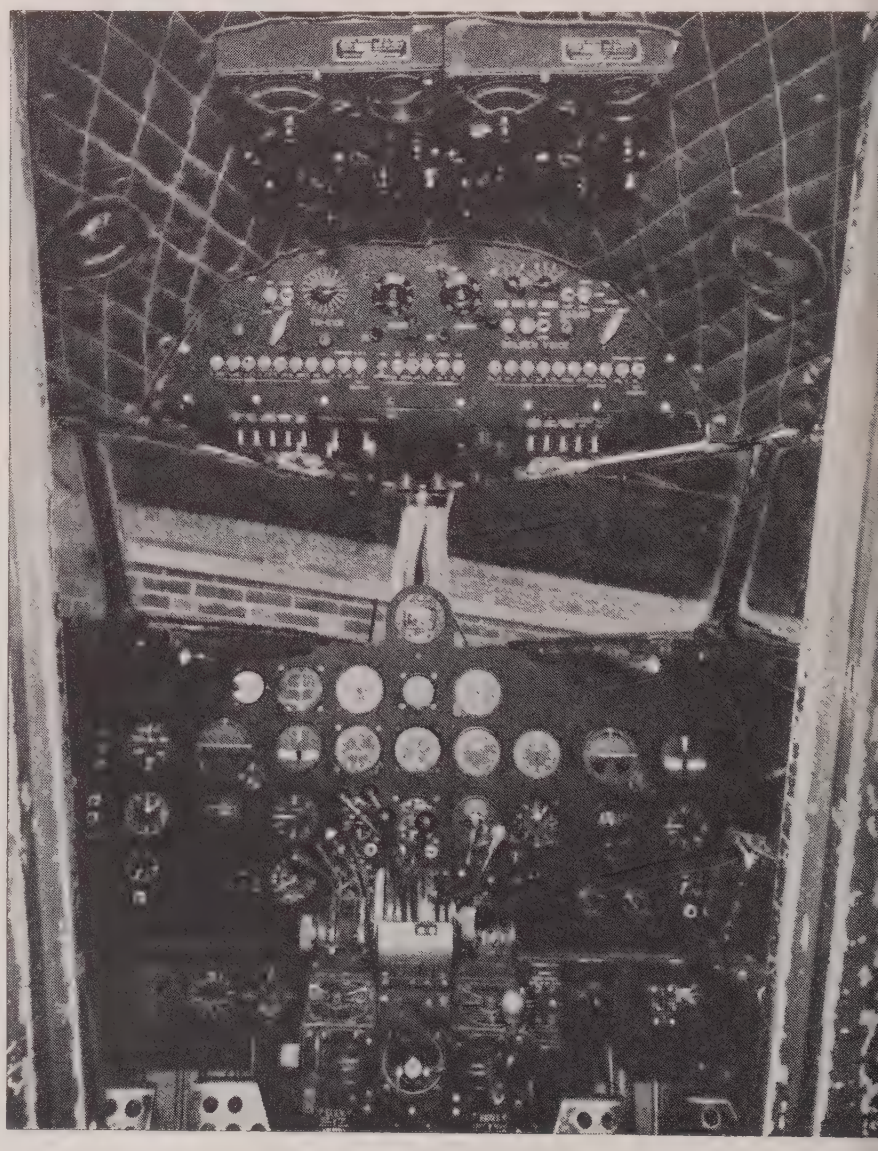
Along the same line, some of our compa pilots have suggested that inclusion of r ings, certificate number, etc. would add the usefulness of the directory and al facilitate filing of flight plans and repor

CAOA on Aviation Industry Advisory Panel, ACC

In order to assist the Air Coordinati Committee in formulating top-level nation policies which affect company aircraft ow ers, the Corporation Aircraft Owners Ass ciation has been invited to serve as a me ber of ACC's Aviation Industry Adviso

(*Continued on page 60*)

COMPLETE is the word for it. This photograph shows the instrument panel of the Lockheed *Lodestar* executive airplane owned by the Falstaff Brewing Co., St. Louis, Mo.



Civil Air Patrol

(*Continued from page 21*)

Lackland Air Force Base, Texas, CAP cadets make excellent airmen.

Another mission in which CAP figures almost daily is, of course, the search and rescue work mentioned earlier. CAP units make "dry runs" to practice for an ARS alert. Units fly several mock searches for each one that actually occurs.

The "real thing" has not yet occurred for the new Mobile Support Unit to work out on and no CAP member would hope for that. Yet, regular practices are held for this area of Civil Air Patrol activity, preparing for service in case of atomic or other disaster. The Mobile Support Unit is CAP's air power package for Civil Defense, a unit of 15 light airplanes and 17 pilots, with adequate reserves of personnel and equipment. Together with its "rolling stock," communications facilities and the first aid echelon, the unit alerted for service airlifts most of itself into the distress area to aid and evaluate.

Philadelphia and Wilkes-Barre, Pa., have held outstanding exercises in the use of the MSU. Recently, 25 MSU's flew into Pike County, Pa., to hold a huge two-day search for a lost hunter. Between the air and ground echelons of an MSU—such as hit Pike County—much strength is available for Civil Defense should the need arise. In the event of disaster in such cities as New York, Philadelphia or Washington, the MSU's from at least six CAP wings immediately would be alerted for services at the scene, with an average of about six units from each wing. Therefore, approximately 540 CAP airplanes and other supporting MSU equipment would be available on the site.

In addition to 52 wings, CAP has 132 groups, nearly 600 squadrons and almost that many flights in its unit strength set-up. Active senior members—both men and women, of course—number nearly 46,000. A heavy percentage of that figure comprises pilots and those people who are in the process of learning to fly.

These CAP seniors can put more than 4400 privately owned airplanes into the air for Civil Air Patrol. These planes include such craft as Piper *Pacers* and *Cubs*, Ryan *Navions*, Beech *Bonnanza's*, Luscombes, Cessna's, Aeronca's and Taylorcrafts, among many other types of two-to-five-placers.

On the experience side CAP does not stand short, either. The wing commanders—one for each State and Territory (rank of CAP Colonel)—are real old-timers in aviation. The "average" wing CO is about 48, has been a professional in aviation for approximately 19 years and has been a pillar of strength in promotion of aviation.

USAF and CAP have become close associates in the postwar years. Each summer the Air Force is host to cadets of the Patrol during encampments on Air Force bases. In a few days the first of the 1951 encampments will be held over the Nation, followed closely by the 1951 International Cadet Exchange. This year that event in International goodwill embraces 14 countries and the U. S.

The Civil Air Patrol is engaged in Armed Forces Day observances at Army and Navy bases as well as at its own installations, for CAP enjoys good fellowship in all military communities.

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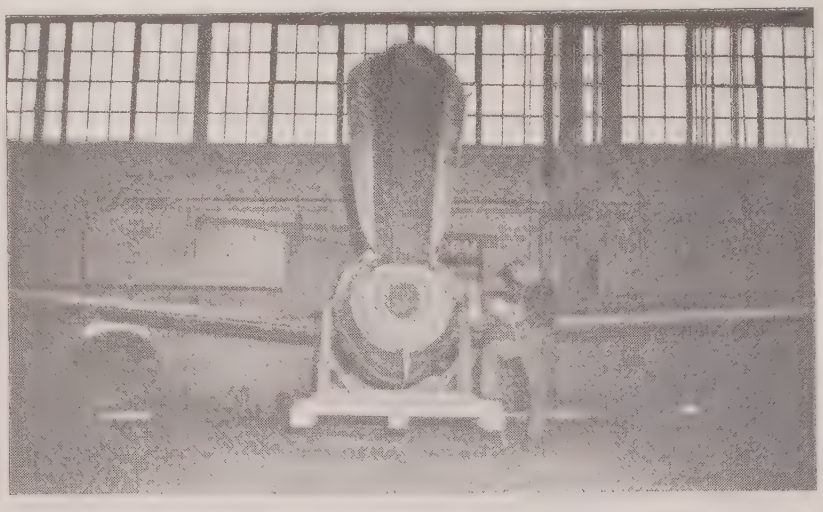
RECRUITING U.S. ARMY U.S. AIR FORCE

U. S. AIR FORCE



THUNDERJET, with nose air intake duct sealed against corrosion, is placed on the bed of the crate in which it will cross the Atlantic to a European nation

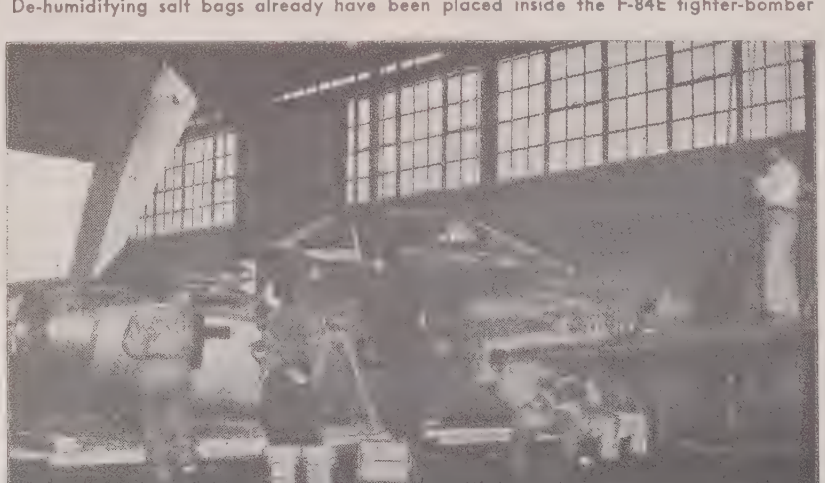
Thunder Jets to Europe

HOLES PLUGGED against dust and water, the rear fuselage section is taped

As part of the Mutual Defense Assistance Program, Korean war-tested Republic F-84E *Thunderjets* are moving by fast freighter in undisclosed numbers to European nations. These planes will help bolster allied nations against aggression. The photographs shown here tell the story of a plane's preparation for shipment, after the over-600-mph *Thunderjets* leave Republic Aviation Corporation's Farmingdale, N. Y. plant.

The *Thunderjet's* Allison J-35 jet engine is removed from the fuselage and "canned," then the fuselage itself is sealed and blocked by tape and a plywood lid. Nose intake duct is sealed against corrosion. Then the wings are removed and packed, and the whole business crated for safe shipment to Europe.

WORKMEN disconnect *Thunderjet's* wing while other laborers tape up all openings. De-humidifying salt bags already have been placed inside the F-84E fighter-bomber



Up Front in a "Six"

(*Continued from page 17*)

with flight-instrument operation.

Next to maintaining straight-and-level flight at a constant altitude the crew is most concerned with powerplant performance. The center panel ahead of the pedestal is devoted almost entirely to engine instruments and is best viewed from the seat of the Flight Engineer (Second Officer). BMEP and manifold pressure gages along with tachometers enable the Flight Engineer to draw a known amount of work from each engine. Charts and graphs are supplied by Pratt and Whitney, the engine builders, for computing throttle and propeller settings (as reflected by engine instruments) to obtain a desired horsepower at a given temperature and altitude. The remaining gages record oil and fuel pressures, carburetor air, oil and cylinder-head temperatures and the rate of fuel flow into the engines. Replacement engines for a "Six" cost in the neighborhood of $35,000 apiece; since low oil pressure can result in an engine chewing itself to bits within a matter of minutes, the need for adequate cockpit indications of such malfunctions is readily seen. Red and amber warning lights automatically call attention to below-limits pressures, giving the crew a chance to save a sick engine and, more important, prevent possible fire and vibration damage. A wing-flap position indicator and an outside-air temperature gage which reads in both Fahrenheit and Centigrade also are found on the center panel. So much for the broad main panel which extends across the cockpit: flight groups for the two pilots, with engine instruments in the center.

Now for a look at the pedestal which is, in case you are new to big ships, that box-like business rising from the center floor. At the extreme front are located the fuel-tank selectors and cross-feed valves. Fuel is carried in six, eight or 10 main, alternate and auxiliary cells, (totaling up to 4,248 U.S. gallons) depending on the model. Except on short hauls, it is usually necessary during the course of a trip to supply engines with fuel from several sources or feed the contents of one tank into two or more engines. Numerous tank-to-engine combinations are available. On top of the pedestal are the throttles, four offset toward each pilot, and between them is the master propeller control which simultaneously governs the speed of all engines. A small box of stand-by controls nearby are brought into play in the event of failure of the prop synchronizing system. The back side of the pedestal, top section, consists of four remote-control units, namely (from left to right), radio compass, automatic-pilot controls, controls for HF and VHF, marker beacon and ILS radios, and a second radio compass. Note that the compass controls are conveniently next to each pilot. Automatic direction-finding readings from compasses are shown on a common indicator below the Captain's flight group.

On the left rear side are the mixture controls which meter fuel to the engines, and a lock to hold them in their settings. A second row of four levers at lower right regulates carburetor heat. All that remain are the auto-pilot engaging handle, wing-flap control, hydraulic bypass valve ("free-wheels" system when hydraulic equipment is not being used), and the aileron trim wheel. Elevator

trim wheels are on the sides of the pedestal, within easy reach of each pilot. A big handle in the rear retracts and extends the gear. And if you're looking for the rudder trim, it's in the vee of the windshield, just beneath the magnetic compass.

So far, so good. Now to the paraphernalia on the ceiling, all of which is just as logically arranged. Controls used frequently are close at hand, little-used items fill in the spaces. First, on the center overhead panel right over the windshield, those 12 big gages itemize fuel and oil quantity, the gas load being measured in pounds. Smaller gages record hydraulic and anti-icing fluid levels. The lower row of switches, from left to right, raise, lower and turn on landing lights, regulate cowl-flap position and shift, electrically, engine superchargers. Right over the Captain's seat is the triangular heater-control panel from which are operated the air-foil heaters for wing and tail de-icing, prop de-icers and main cabin heater. Gages show temperature at heaters and pressure of fuel.

The cabin supercharger panel, also triangular, is directly above the First Officer's position. Since cabin pressurization is fully automatic in a "Six," the instruments here are used only for reference, giving altitude and rate-of-climb and pertinent data on cabin supercharger operation. Should the automatic feature get out of kilter, the First Officer opens a small door in the panel and controls the system with the manual switches behind.

To the rear of the heater controls, Captain's side, are the heater fire controls on a rectangular panel. A fire developing in or near any heater would be reported here by bell and warning light; switches direct a flood of flame-drowning carbon dioxide to the danger area. Twelve switches are provided for pre-flight testing of all fire-warning systems. Engine fires and rapid rises of temperature in any under-floor compartment are reported to and controlled from the main CO_2 panel, a long row of handles (with warning lights built into them) just beneath the windshield.

The remaining overhead switches are for engine ignition and starting, prop feathering, generators, inverters (convert DC to AC), fuel booster pumps, running lights, wing illumination lights, oil dilution and the manual control, when needed, of oil cooler doors and cowl flaps. Rheostats control cockpit lighting.

And that, in short, is the cockpit of a DC-6. Not so bad. But do not assume from this brief description that there is no more to it than this, or that flying a "Six" in airline service is merely a matter of knowing how to fly and memorizing the position of the 400-odd gadgets. Far from it. There are scores of controls of lesser importance which have not been mentioned, many of which are tucked away out of sight under the floor, behind doors and almost every place a switch or handle could be mounted. Each is in its own way vital to some phase of the job to be done —safely hauling 50 or more passengers from here to there.

We have over-simplified only to show the cockpit for what it is, a masterful grouping of a tremendous amount of equipment within a relatively tiny space. And not the confusing hodge-podge of unrelated levers and dials the layman is apt to imagine it at first glance. You're looking at *one* of the finest cockpits ever assembled—"*the* finest," many believe.

TWA
ONLY TWA TAKES YOU ALL THE WAY
ONE-AIRLINE SERVICE
TO THE CAPITALS OF EUROPE
FROM 60 U. S. CITIES
58 transatlantic flights weekly with the world's largest Constellation fleet.
SEE YOUR TRAVEL AGENT or call
Trans World Airlines
Across the U.S. and overseas... you can depend on TWA

But how does one man, or three, keep track of all this stuff at one time? After all, one human, no matter how highly-trained, can move only so many levers and look at so many instruments at one time. The answer is, they don't and they don't try to any more than a driver tries to watch all the dials in his car and stay on the road at the same time. The best way to understand how a DC-6 crew operates is to fly with it and observe at first-hand. Let's assume we hold cockpit authority on a medium-range run from Chicago to Dallas and have arrived at the airline's operations room an hour and a half before flight time.

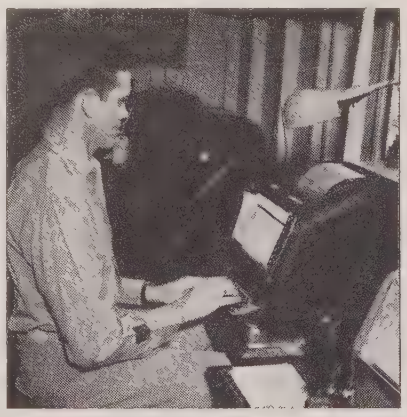
We find our Captain and First Officer huddled over the latest weather sequences. For the moment they are concerned with winds, altitudes, temperatures, weights, alternates and the many other factors that enter into the drawing up of a sound flight plan. Meanwhile, the Second Officer is outside on the ramp pre-flighting the airplane. His thorough inspection starts and finishes at the nose-wheel and covers every section of the big ship visible from the ground. Tires, struts, engines, flaps, antenna masts, accessory compartments and control surfaces are among the items listed on his check sheet. A special eye is kept out for tell-tale leaks around nacelles and fuel tanks, and damage to any part of the structure which might have occurred during flight or ground handling. He checks with mechanics regarding maintenance recently accomplished and goes over the "squawks" turned in by the incoming crew. The inspection is completed by a look through the cabin into the cockpit.

Fifteen minutes before flight time finds the crew in their seats, our Captain on the left, First Officer on the right, and Second Officer on the jump seat between and slightly behind them. DC-6 captains come in all sizes and descriptions and ours strikes a good average. He's about 40, figures his time at close to 15,000 hours and went into airline flying when DC-2's were the last word. The co-pilot and engineer are World War II alumni, the main difference between them being the dates they were hired and about 5,000 flight hours. These men feel as at ease here on the flight deck as they would in their own cars. Perhaps even more so, for they won't have to spend half the trip wondering what "the other fellow" is going to do. They see no confusion in the 400 gadgets which face them from every corner of their working quarters.

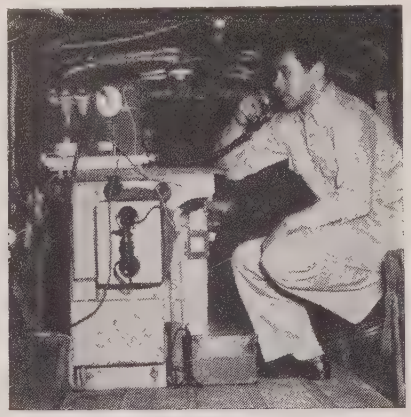
At the same time, they will not rely solely upon their experience or training—and they have plenty of both—to fly this million dollar airplane and its priceless cargo to Dallas. Out comes the checklist with the engineer calling off the items to be checked, and the pilots responding as checks are made,

"Main circuit breakers"....."On"
"Parking brake" ....."Set"
"Battery switch"....."Battery and ground power"
"Battery transfer switch"....."Ground power"
"DC voltmeter selector"....."Check bus"
"Oil cooler switches"....."Automatic"
"Cowl flap over-ride"....."Positioning"
"Fuel pump circuit breakers"....."On"

(*Continued on page 49*)



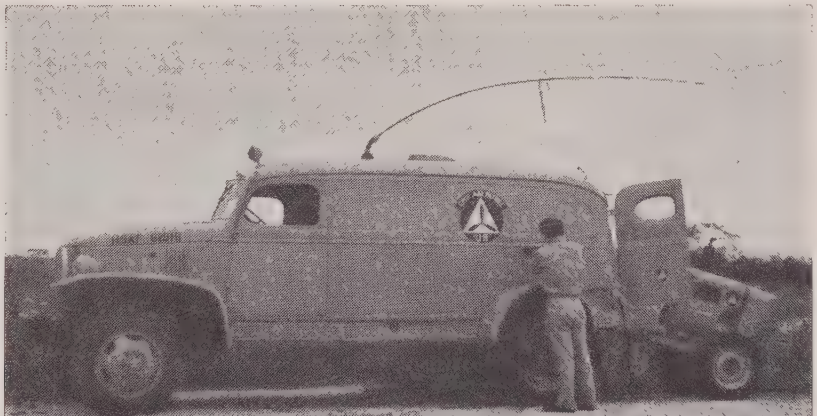
CO of the Civil Air Patrol in Hawaii, Col. Wilhite, ran a teletype circuit

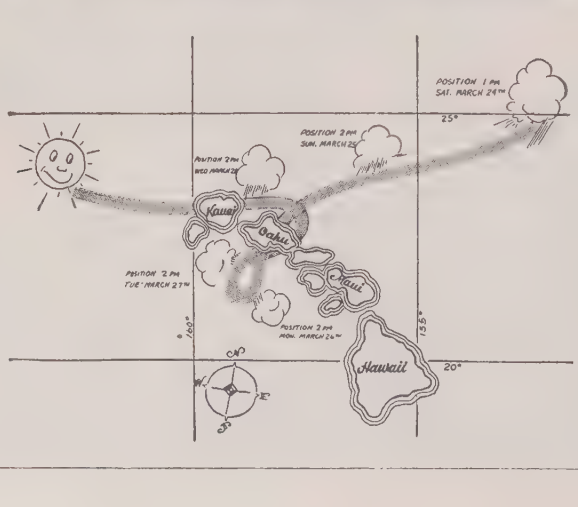


CAP member Al Mokuau operated the radio truck for emergency communications

HAWAIIAN RESCUE

Members of the Hawaii Wing of the Civil Air Patrol went to the rescue recently when a tropical storm looped the loop its way across the island of Oahu. Floods, landslides and wind damage put civilian utilities out of operation. The Honolulu police called in the CAP to help establish communications and to aid in evacuation. The Hawaii Wing answered the call and did much to bring order out of the chaos caused by the freak spring storm.





POWER UNIT is rigged to CAP mobile radio unit. This permitted communications even when the truck was moving along highway. CAP members manned trucks

PATH of the tropical storm is shown on this cartagraph. Track shows how the storm moved in from northeast, crossed Oahu, swung in a circle, worked back

New to the "U" Bird

(*Continued from page 19*)

handbook in his hand, he checked himself out in the *Corsair*. After 15 hours of familiarization in the air, he joined a group of regular fighter pilots in practicing carrier-landing procedure on a simulated deck marked out on the El Toro runways. Fifteen hours didn't give him too much experience in that type before attempting to fly a carrier landing pattern over the tree tops and only a few knots above stalling speed. But after the usual erratic approaches of a beginner, his passes were finally approved by the landing signal officer and he was ready to try a carrier.

Here the determined man was stymied again. Penn did not have the 50 hours of experience in the *Corsair* required to go aboard for final qualification. The pilots with whom Penn had been practicing were scheduled to "bounce" on the *USS Philippine Sea* in a week. Penn had to build up 20 hours of time in that period. This he did by several long cross-country navigation training flights to Arkansas, Colorado, and up and down the Pacific Coast.

He qualified on the *Philippine Sea* about the time that the North Koreans crossed the 38th parallel. Major Lund heard this story so many times that he began to see the mild-mannered but eager-beaverish captain in his sleep. He wondered why Penn was in such a hurry to wade into a job in which a man could be killed so easily. He certainly didn't look like the Hollywood type of dashing, devil-may-care fighter pilot. But for that matter, neither did the other flyers in his squadron. He looked more like the average young American with a family. In fact he had a wife and two sons, one six and the other two and a half years old. Penn was of medium height, had hazel eyes and medium-dark blond hair. The way he talked, Lund was sure Penn should have been a salesman.

"Look, Major, I won't be a good Marine until I've had a tour of duty in fighters," Penn insisted.

Major Lund weakened and let Penn join the squadron. The captain wanted to learn so much in such a short time that Lund made him training officer in charge of scheduling lectures and demonstrations on tactics, the *Corsair* power plant, emergency procedures, recognition of enemy equipment and planes, survival, and all the other things that fighting men have to know thoroughly.

"My wife wasn't at all happy about my joining the "Death Rattlers" even though she was a general's daughter, (Brigadier General Buddy Chappell, you know)," Penn confessed. "I had to work on her over a long period of time before she resigned herself to my going. I sort of hated to leave her and the kids but, after all, I am a Marine."

In July the squadron sailed out of San Diego on their jeep carrier.

On Penn's first combat mission, August 6, he flew on the wing of Major Robert Johnson of New Smyrna Beach, Florida, the executive officer of the squadron. They were going to strike at the North Koreans who had squeezed the United Nations forces into the southeastern corner of the peninsula.

They circled a bridge at Sachon and

(*Continued on page 51*)

Up Front in a "Six"

(*Continued from page 47*)

. . . and so down through the list of nearly 80 separate checks. No more than three minutes are needed to run through the checklist and the result is a cockpit completely in order and ready for flight. Nothing which contributes to the proper operation of the airplane can have been overlooked.

And now, on a signal from the ramp, the Captain switches on ignition and says, "Clear three." The engineer reaches for four ceiling switches, mashes them together briefly, then eases a mixture control into position with his free hand as No. 3 engine comes to life and settles into idling at 1,000 rpm. Numbers 4, 2 and 1 tremble momentarily in their mounts, spit excess prime through short stacks, and go to work. The crew goes to work, too.

Our Captain tools 117½ feet of wing span away from the gate and out the congested taxiway, checking his cautious progress occasionally with brake, and listens to the First Officer's conversation with Chicago Tower regarding ATC clearance and taxi instructions. Our Second Officer sees little of the outside from his seat nor is he concerned with it just now. His job is to exercise the props, check generators, carb heat, inverters and generally clean up the "After Starting Engines" section of the checklist. By the time we roll up to the active runway, all that remains to be done is the actual run-up. Quickly, superchargers are shifted and mags checked, and the rest of the checklist is called off, ending with.

"Wing flaps" ..... "20°"
"Cowl flaps" ..... " 4°"
"Gust lock" ..... "Off"
"Controls"..... "Loose as a goose and ready for use"

The two with the Captain have heard that expression many times before and don't laugh. But, thinking of the seniority list, they grin politely—with the Second Officer overdoing it a bit.

Brakes are released and as our "Six" waddles out to the runway the co-pilot calls his ATC back to the tower for verification. Our Captain works his throttles forward until 54 inches of mercury stand on the manifold pressure gages. Following through on his own throttles, the First Officer sets them exactly. The engineer keeps his eyes on engine instruments ready to call attention to a low-pressure reading or over-heating. At 95 Indicated the ship breaks ground and the Captain calls for gear up and his first power reduction—44 inches, 2600 rpm. Flaps are pulled at 145 and power is reduced to climb setting. All this, from pulling away from the loading gate to actual take-off, takes just five minutes.

Slowly, the 82,000-pound ship swings to course and climbs for altitude. The engineer keeps throttles adjusted for climb power, not relaxing his continual re-checking of the engine readings, and electrical and pressurization instruments. The First Officer, having reported our time off to the company, gets his flight progress forms in order and assists the Captain by handling radio contacts. And there's plenty of time left over to do his own checking around the cockpit. The Captain handles the flight controls and observes the work of his assistants. Although each member of the crew has his own special tasks, few responsibilities are left to the judgment of any one of them. The Captain is senior man, of course, with the over-all responsibility of the trip resting most heavily on his shoulders. All final decisions are his, but this does not in any way decrease the interest of the co-pilot or engineer in conducting a precise, safe trip. So, in a manner of speaking, each man here in the cockpit of a DC-6 is working and checking up for himself just as though the proper operation of the flight were his personal worry. Which is exactly as it should be.

At 18,500 feet, our assigned altitude, engines are adjusted again to recommended cruise settings and the cruising checklist is run off. From now until our descent into Love Field at Dallas, the flight is in many ways an automatic process. If the Captain elects to engage the auto-pilot, the ship will fly itself from here on in with only occasional minor adjustments. Each engine will continue to put out its 1,000 cruise-horsepower as long as fuel is made available to it. Generators will unload their 28 volts, superchargers will keep passengers at a comfortable 8500 feet, thermostatically-controlled heat will warm them, and coffee will stay hot all the way to our destination. The chances are almost 100 per cent that all of our ship's equipment will perform normally throughout, leaving the crew with little to do except monitor the instruments and call in check points as they slip by. Few controls will have to be moved and few switches will need attention. But the crews of big aircraft are not paid for what they do so much as for what they *can* do, should the need for emergency action arise. The flight described has been perfectly routine so far. But what if it doesn't continue that way?

Each situation presents its own set of problems and it is for the crew to supply the solutions. Few professions or trades call for the varied training required of all-weather pilots of big aircraft. Instruments take much of the guesswork out of the business but they can only report and record. Human judgment, based on thorough schooling and considerable experience, must step in to anticipate, plan and act where machinery leaves off.

Losing an engine in a DC-6 is not a tremendously serious affair, even if the loss of power occurs during take-off. A take-off under a 200-foot ceiling with half a mile of visibility is routine practice today. And a gross load of 92,000 pounds is quite ordinary on certain long-range operations. But lose an engine just as you lift this weight from the ground and climb into a low ceiling and you have a problem on your hands. A mean situation like that isn't handled merely by recognizing the difficulty and deciding what to do about it; it is met with immediate corrective measures which needed only the emergency to put them into action. The crew follows through with the same coordinated effort displayed during a perfectly normal take-off. It's a procedure the crew knows well—one the men have trained and studied for.

How complicated is this work? Under normal conditions it's a cinch for airline men to fly their runs. How well are they doing the job? Look at the record of scheduled air travel safety. Relax in the foam rubber luxury of your airliner seat and let the boys up front do their job. It may look complicated to you but it's old stuff to them and they do it very well.

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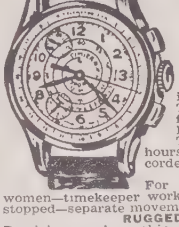

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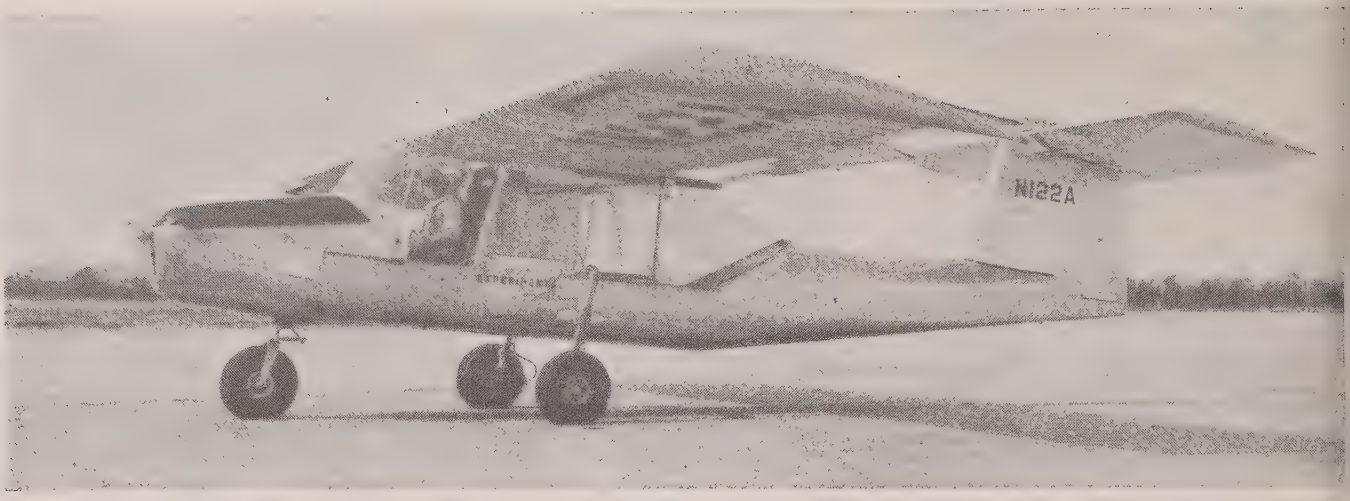
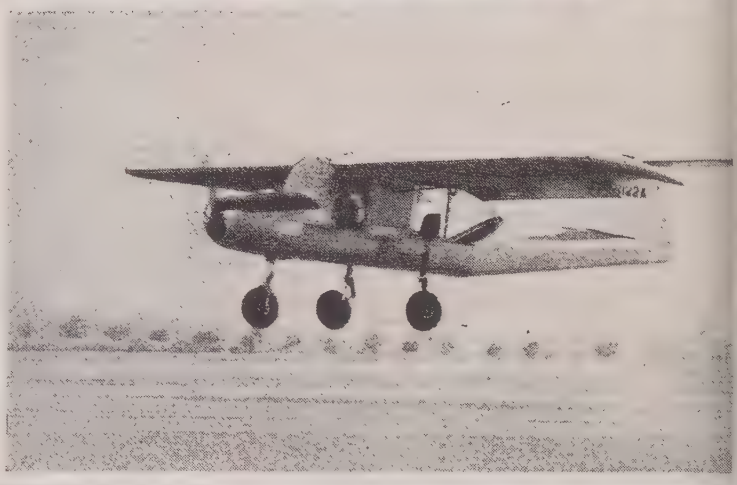


Fl-23 is an all-metal high-wing monoplane designed for observation and reconnaissance. It is a two-placer built to give maximum all-around visibility

POWERPLANT is Continental E-255 with a normal rating of 235 hp at 2800 rpm at sea leve'. Propeller is a two-bladed Hartzell. It has 60-gallon gas load

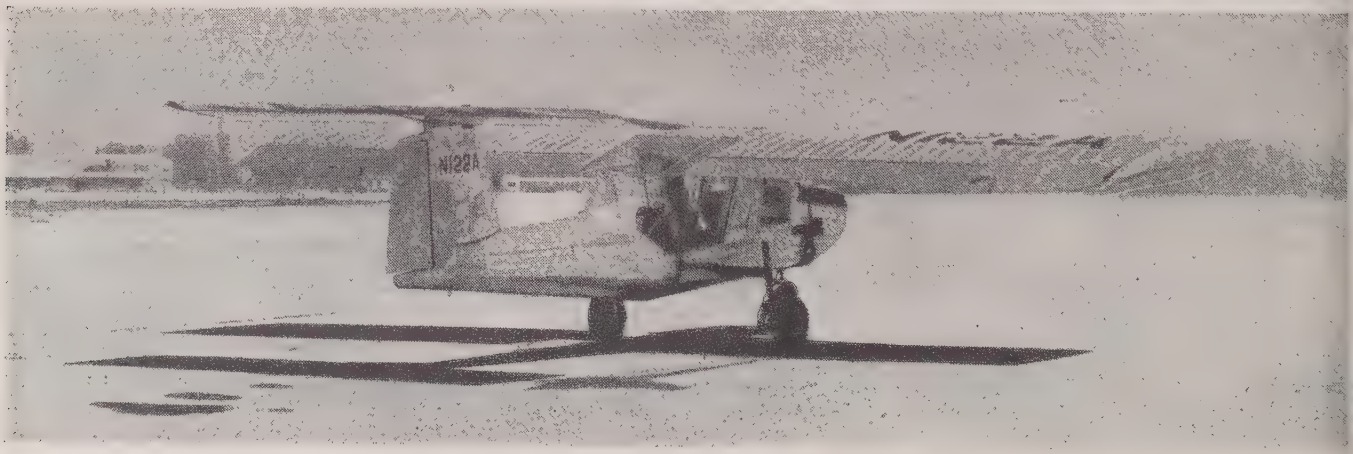
Fletcher Fl-23

Designed and built for Air Force competition, the Fl-23 is a two-place liaison monoplane powered by a Continental E-255 engine of 235 hp at 2800 rpm. All metal, the plane employs a cantilever high wing, and the fuselage is of aluminum alloy monocoque construction. It has a fixed tricycle landing gear with steerable nose wheel. The Fl-23 has a level-flight high speed (placarded) of 133 mph; it cruises at 118 mph and has a stalling speed of 38 mph (with flaps). Its sea-level climb speed is 1180 feet the first minute, and it has a maximum range (with 60 gallons of gas) of 485 miles. An auxiliary tank adds 30 gallons and increases range. The Continental engine drives a two-bladed Hartzell prop with a diameter of 84 inches. The Fletcher Fl-23 has a wing span of 33 feet 4 inches; is 28 feet 4 inches long and sits 8 feet 1 inch high. The rear canopy is clear and permits rearward visibility.



LANDING speed of the Fletcher is 38 mph with flaps. It cruises at 118 mph and has top speed of 133 mph. Maximum range (normal load) is 485 miles

CANOPY section (rear) is clear and extends to the fuselage to permit maximum rearward visibility. Seating is tandem, with observer's seat swiveling



ew to the "U" Bird

(*Continued from page 48*)

ed over into a dive. Penn didn't have to review his dive-bombing lore. He as if he were flying straight and level the world had been raised up as a wall front of him. The electric gun sight ed in his windshield. He "walked" the er in the center of his sight up toward bridge as he bore down. His air speed eased and his altimeter unwound fast. ad of him Major Johnson released his b and pulled up. Penn suddenly realized the bridge was getting bigger and er. He thought of target fixation and of ts who had mysteriously flown into the nd.

t 2,000 feet he pressed a button on his rol stick and pulled up after Major nson. The bridge was enveloped in ke, dust, and spray.

ground controller then told Major John- to hit a railroad roundhouse at Chinju rockets. When Penn released his rock- he saw black smoke puff out of the ows of the building and bright flames ing it over greedily. They finished their ion by strafing enemy troops and camou- ed supplies covered with straw under a of trees.

enn glowed on his return.

Major Lund put his arm over his shoul- s and joshed him. "Will you look at this n guy! He drew his first blood today comes strutting in here like a first class ter pilot."

hat brought a laugh from the ready room. enn laughed too. "I wasn't sure I hit thing, but I had a big time. Just like Fourth of July, only better."

hen the conversation changed to the ny troops, Penn mused, "I must be a ken-hearted son-of-a-gun. I sure hated now those people down."

We don't have any choice," someone else him. "Those characters are killing our men."

fter a few more missions, Penn began have more confidence in his accuracy. one flight when his division leader's o went out of commission, he was given lead to strike an enemy troop concen- don in a village near Seoul.

he ground controller below told him there were about 300 enemy troops and ammunition dump there.

Look," the controller radioed, "we're a hundred yards away from the vil- e. We don't want you to set any records the number of tons of bombs dropped. e the taxpayer's money. Just bomb that ding with the tin roof and those other ks to the north."

e was evidently a character, a funny man. For your information," Penn radioed k, using the standard code call signs course, "we have only two bombs left, we do have a full load of rockets and no."

Roger," the pilot on the ground re- ed, "hit the building with the tin roof the bombs and use rockets on the rest."

s Penn described the strike later, "I k' I hit the building with the tin roof my bomb. Technical Sergeant Martin derick hit the other. It was the ammo np. It blew to bits." He went on, "Then started knocking out huts one by one with rockets. The Reds began to scurry out of the others like cats out of a kennel, and our Marines on the ground advanced as we strafed the running Reds ahead of them."

He had one more thing to add. "The controller said we did a doggone good job."

Major Lund was glad to see Penn fitting into his niche in the squadron. "He really tried hard," he declared.

Penn learned a lot observing the carrier landings of his other squadron mates. One calm day when the carrier was shaking and quivering in its effort to churn up full speed in order to get all the wind possible over the flight deck, he was on the bridge watching his squadron mates land.

One pilot came into the groove a little too high. The landing signal officer signalled a "high dip" followed by a "cut." This meant that the pilot was to nose his plane down a bit and then to cut the throttle for the landing. The pilot answered the signals too slowly for the amount of wind across the deck and bounded his wheels on the deck and sailed over the safety barriers. One of the barriers caught his tail hook and pulled the *Corsair* crashing down on the plane of another pilot who was taxiing forward after his own landing. The buzzing propeller chewed up the tail of the taxiing plane and stopped after cutting through the cockpit. The pilot in the plane underneath slumped over. It appeared as if the prop had sliced into him. However, he was lucky. He had been merely hit by the flat of the blade as it stopped. He was soon flying again.

Penn learned a lesson from that incident. "Be alert. Obey the LSO's signals quickly."

Penn was getting along fine until his eighth flight off the carrier. He was flying with a heavy load of high explosives.

"I felt like a flying arsenal," the captain described.

When he was all set to go, he signaled "ready" to the catapult officer. The latter brought his up-raised arm down in a vigorous chop and Penn felt as if a truck had hit him from behind. His plane was pushed off the ship with increasing momentum. If he had wanted to stop, he couldn't have.

Again it was one of those days with no wind. The carrier was struggling along valiantly, but she wasn't able to work up quite enough wind across the bow for Penn. He spun into the water to the left of the bow of the ship.

"I broke off my left wing and flipped over on my nose," he recounted. "As I pushed out and away from the cockpit into the water, I saw the heavy tail coming down upon me—! I must have dived down about 30 feet. It seemed like a year before I got back up. A destroyer picked me up."

That was in August. Penn was soon flying again as if nothing had happened. By November he was a veteran with almost 50 combat fighter missions to his credit.

Then about the time the Chinese Communists were putting the pressure on the Marines at Chosen reservoir Penn was ordered back to MAG-33 as assistant operations officer.

He had realized his ambition to fly fighters off a carrier in combat. But he has one more mission to accomplish, in fact he may already have done so, and that is to have his classification officially changed to that of a fighter pilot.

After almost 50 fighter sorties, he was still listed as a transport pilot.

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(*Continued from page 42*)

caused an accident—if the propeller had been pulled through properly. But because of high engine compression, the men foolishly elected to push the prop through with their shoulders. This, too, has been done before without messy results, but not this time . . .

As the prop was pulled through, the engine fired and continued running *on the booster coil.*

Certainly this was a perfect combination of errors for a fatal accident. But these men were lucky. One of them got away with a broken arm; the other received only a bad bruise.

Why, oh why, take these unnecessary chances! Strict observance of flight regs and safety precautions will eliminate most aviation hazards.

Ignorance is Costly—A pilot was on X-C in a high-powered, single-engine job, the kind of a plane he had flown for years and claimed he knew "like a book." When he noticed a loss of hydraulic pressure, he headed for the nearest airport.

Prior to landing, he lowered his wheels by closing his main system hydraulic valves and opening the No. 3 by-pass valves. He failed to close these valves again, however, and during landing received brake pressure from the brake accumulator only; insufficient to maintain control. Fortunately, there was no damage during the ensuing groundloop.

Upon finding inadequate repair facilities at this field, the pilot immediately took off for a larger field, 10 miles farther on. After landing at this field, he didn't need any repairs—the reason being that he had even less brake control than on the first landing. When they pulled the plane out of the ditch, it looked like it had been through a pretzel factory.

This dumbbell (guess who) had two good chances to prevent said accident: first, by knowing how to operate his hydraulic system; and second, by having sense enough to stay on the ground after finding that his brakes were defective.

Anyone can, and everyone should, become familiar with his hydraulic system, either by having someone explain it or by studying the manual. Common sense is something else

"This look can cost dough"

again; it isn't so easily come by. Experience is the best substitute, but you even have to mix a little brains with that to produce good judgment. Dilbert had 850 hours, but he certainly didn't use the old bean when he took off that second time.

Brains is King—There are other stories about pilots who had leakage of the hydraulic system, but not of the brain.

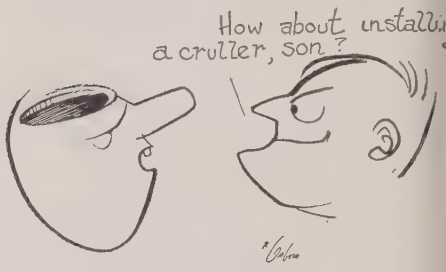
When their hydraulic pressure failed, they knew their equipment so well that they added enough fluid to the hydraulic reservoir to regain pressure. They added regular hydraulic

"This look is worth dough"

fluid, if available. If not, they knew any fluid would work temporarily, so they added water, tea, coffee, soup broth, and even urine.

Anyone can hold a plane on course. It's knowing how to correctly meet all emergencies that designates the aeronautical expert.

Warning: When fluid other than oil is left in the hydraulic system, corrosion will set in; so flush it out and replace with specified oil.



Gone with the Wind—The amount of damage which occurs to parked airplanes every time a big wind blows indicates that many people don't know how to secure them properly. Or maybe they just don't give a damn.

There isn't much you can do for the latter group, but just in case the "don't-know-how" boys might want to obtain maximum protection and safety:

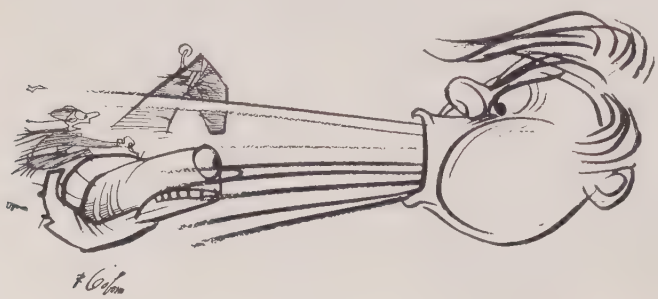
1. Planes should be moored *headed into* the prevailing or expected wind.
2. Lock tailwheels in a fore and aft direction.
3. Sufficient tie-down lines should be used to prevent lateral and perpendicular movement. For permanent anchorages, rings should be set in concrete aprons or attached to concrete blocks sunk in the ground. If you have to use wooden stakes, use two at each location, set at different angles.
4. Wheel chocks should be anchored securely or pegged down on ground parking areas to minimize plane movement. Parking brakes locked, of course.
5. Install "spoilers" along three-fourths of the wing span to reduce lift. These spoiler boards should be covered with felt along the edge in contact with the wing, and should be located approximately 15 per cent aft and parallel to the leading edge.
6. All controls should be locked and control surfaces securely fastened with felt-padded wooden clamps.

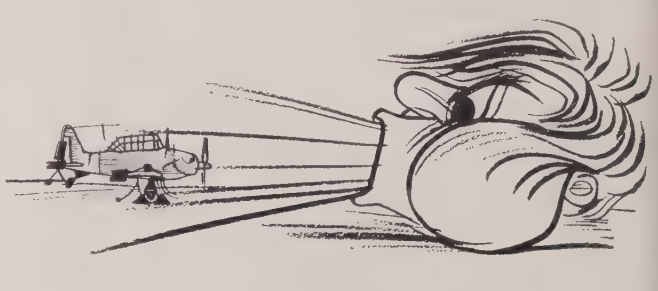
That's all it takes to withstand most blows.

Oh yes, and don't forget to lock up or tie down all loose gear; anything, in fact, that may become flying debris.

SETH'S SAFETY QUIZ

1. You are flying at 16,000 feet and begin to feel either drowsy, nauseated, over-confident or hilarious. What do?
2. Visibility at point of departure and destination is unlimited. There is a solid layer of clouds extending from 1500 to 5,000 feet over





most of the route, but you propose going all the way "over the top." Is your flight governed by IFR or VFR?

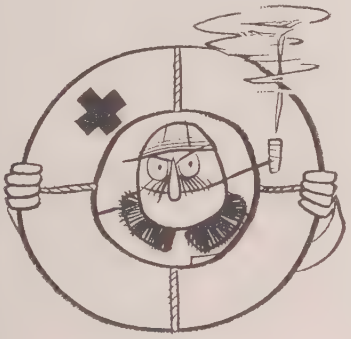
3. Is flying speed alone a guarantee against stalling?

4. For what maneuvers and under what circumstances should the electric fuel pump be used?

5. Why is it dangerous to bank during a dive pull-out?

6. What is the difference between normal rated power and take-off power?

ANSWERS



1. You are probably suffering from anoxia, lack of oxygen. Get below 10,000 feet immediately, using emergency oxygen if available. And be sure your oxygen equipment is working properly before going back up.

2. Instrument Flight Rules.

3. No. If sufficient acceleration (G) is applied, an airplane can be stalled at terminal velocity.

4. For starting, take-off, landing, switching fuel tanks and for emergency and altitude operation.

5. Bank increases and prolongs "G" thus increasing possibility of 1) blackout, 2) high "G" stall, and 3) structural failure.

6. Normal rated power is maximum permissible power for *continuous operation*. Take-off power usually is limited to five minutes. See Pilot's Handbook for manufacturer's instructions for specific engines.

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New Horizons to Scan

The Santa Monica, California, pilots' association is running true to form. . . . to Miss Cleo Moore's form! This lovely RKO starlet was unanimously elected by that flying group as "the girl I would most like to have in my plane when I turn on my Autopilot." Pilots on the East Coast "Roger" the California idea and wonder if Miss Cleo "Wilco." At any rate, they're both beauties . . . . the gal and the autopilot.

Give 'Em a Jet

(*Continued from page 23*)

no bothersome adjustment of tabs as there is whenever a pilot changes the power setting in reciprocating aircraft.

Of course, the pilot sometimes has to set his elevator tabs slightly as he empties his fuel tanks and the center of gravity shifts. But the pilot seldom has to touch rudder or aileron tabs.

Speaking of ailerons—they're easy enough to control. They have hydraulic boosters so it takes only a touch by the pilot to move them, even at top speeds.

As for the rudder, it's seldom used. For one thing, below 70 knots, it's ineffective. And above 350 knots, no pilot is strong enough to move it. Yet the plane is easy enough to trim right or left with tabs if necessary.

In a stall, most jets handle beautifully. Again, with no engine torque to complicate matters, the left wing doesn't drop off first. The jet just sort of shudders and drops off straight instead of inverting or "going over the top."

There are pilot comforts, too. A cabin heat rheostat holds cabin temperature constant at any desired setting regardless of temperature changes in outside air. And, pressure inside the canopy stays comfortably constant regardless of pressure changes due to differences in altitude.

Of course, it's not all gravy when you're flying jets. Despite the advantages of added speed and ease of operation, there are disadvantages, the main one lying in the severe limitations which have been imposed on maneuvers. In the F9F *Panther*, for instance, intentional spins are prohibited. The plane will recover from spins if normal recovery procedure is followed, but engineers have still put a ban on intentionally going into one.

Furthermore, with pilots operating close to Mach 1 most of the time, they must always be watchful that they don't go into compressibility. At around 80 per cent Mach 1, or Mach .8, the speed added in a slight dive could push the plane over the sonic barriers. And, unfortunately, some planes go deeper into the dive and at increasing rates of speed once they pass the speed-of-sound wall. The penalty is structural disintegration in midair.

These limitations mean that the pilot must restrict his let-down speed, or "penetrating speed," after he has been cruising at high altitudes. He might well come through the overcast at too high an IAS and hit thermals which could snap the wings off. As John Murray, Head of jet flight training at Floyd Bennett Field, puts it, "In jets, there's much more danger that the pilot will hurt the plane than there is that the plane will hurt the pilot."

The high rate of fuel cosumption is another disadvantage. Information on the range of most jets is restricted, but it's well known that this type of plane is severely limited in the distance it can cover because it burns fuel so fast. So, the pilot must plan every hop with extreme care. He can never afford to be more than a few minutes behind his ETA.

Even on the ground, the pilot must be careful of fuel consumption. Every minute

idling speed cuts many minutes from the ane's endurance. And that brings up an d facet in the story of jet fuel consumpon. Actually, the higher the pilot flies and e further forward he pushes his throttle, e greater range he'll get. It's the story me true of the old man who was driving s Model T as fast as he could so he uld get home before he ran out of gas. he longer a pilot can operate at high altides and at high throttle settings, the eater his range will be. In fact, if he es between 10,000 and 35,000 feet, he can most double his range.

In the air, both high speed and high titudes add to the difficulty of operation. rst, high speed. It makes ordinary navigaon procedures obsolete. It's difficult to tch for check points when you're clockg 400 knots. So the pilot has to rely on s "Bird Dog" which he homes in on dinary radio transmitters.

High speed also adds to the difficulties combat. With the rate of closure so high, e plane is on target only for fractions of second. This has necessitated adding dar-controlled flux gates to "range" the rget automatically.

As for high altitudes, they demand forced-eathing oxygen equipment. With such uipment the pilot has to reverse ordiry breathing procedure above 35,000 feet: ring the normal inhale period he has to dax; the mask forces the air into his ngs for him. During the normal exhale riod, he has to force the air consciously om his lungs. To keep his breathing comrtable yet efficient, he must learn to talk r radio transmission while he is exhaling.

If we compare a normal jet hop with a p in a reciprocating engine plane, we find st of all that jet starting procedure is less mplicated. After the pilot climbs up the ented steps in the side of the fuselage d settles into the snug cockpit, he has ly to set the throttle and turn on the el master switch. No prop pitch, no mixre control, no primer switch to worry out.

A portable battery is hooked up outside turn over the turbines, and when a spark ows in the tail pipe, the pilot turns on e Ground Starts Switch.

If she flames, he warms up quickly, notg rpm and tailpipe temperature. No mags, blowers, no carburetor air heat to worry out.

With desired cabin pressure and cabin mperature chosen and with the cooling stem checked, the pilot moves the throttle rward until he's getting around 6,000 rpm r taxiing. This is when the fuel literally es up in smoke.

After normal checks on fuel and oil pres re, water injection, and wing locks, the rottle goes forward slowly to full power. nen, gear and flaps up, and he's off. Comre that with all the fenagling for take-off ith a reciprocating engine.

After climbing at more than 300 knots, e pilot levels off at cruising altitude with worries about mixture control, carburetor heat, or blowers. His anti-blackout suit lds to his comfort by automatically pressg against the arteries in his lower exremities to prevent blackout when he puts excessive number of G's on the plane steep turns and sharp pull-outs.

Changing fuel tanks during a hop is simple: the tip tanks are the only ones the pilot has to switch to; the others automatically flow into the center tank and thence to the burners.

To let down, the pilot retards his throttle to a suitable "penetrating speed." At all jet stations, he follows a standard procedure: one minute out on the let-down leg for each 3,000 feet of altitude, then a procedure turn and lose altitude at 3,000 feet per minute. It's here that the jet pilot has to exercise care that he doesn't over-run slower, conventional planes. But the jet can be slowed way down with dive brakes and flaps.

When he's below 50 feet, a red light comes on. With trim tabs set at zero and with flaps down at a speed less than 200 knots, the pilot makes a basic approach. It's not necessary to make a long, flat approach even though air speed in the groove registers around 120 knots.

When the throttle is out, the jet drops like stone, but most pilots keep their speed high and their throttles forward from 100 feet down so they can "flare out" if they need to. If they have to take a wave-off, they add throttle slowly because a sudden surge could put the flame out.

So the pilots can give you plenty of reasons why the jets are easy and comfortable to fly even if there are some disadvantages because of high operating speeds. But, after all, it's high cruising and climbing speeds that you want in a topnotch bombing and gun platform.

And, as Lt. "Ham" Tahler said, "When you can slow roll over and over going straight down the runway at 200 feet without losing or gaining a foot of altitude then pull up and climb out of sight in seconds the way a jet can, you know you're really flying an airplane."

Aerial Braille

(*Continued from page 15*)

such studies as "radio theory and propagation," "instrument construction and techniques in their use," "navigational aids in the Munich area," and flight regulations in general. Also, the theory of flight, icing conditions, instrument let-down procedures, radio facility charts and Pilot's Handbook . . . all were studied until student pilots knew them by heart.

On the aerial "home work" end, each pilot received a total of 10 hours of blind flying before he was qualified for graduation, and this experience in the air, combined with valuable book-learning on the ground, contributed much toward molding him into the skilled blind-flying pilot type of which the 86th Fighter-Bomber Wing now boasts almost 100 per cent.

There have been four classes completed since that first beginning group, and naturally, improvements and advancements in training and technique are still being made. But although the weather surrounding Munich is frequently foggy, the future of the 86th Fighter-Bomber Wing pilots is clear, and their ultimate goal is in sight, for the day when every pilot can fly "blind," skillfully reading his "aeronautical braille" with the fingertips of good training and practical experience, is at hand.

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Although it's wise to avoid malicious gossip, only a monkey shuts his ears to reality. And cancer is a grim reality. We must open our ears to the life-saving truths which will teach us and our neighbors the safeguards against cancer. For humanity's sake — and our own preservation — we must support the crusade against this mortal enemy of man.

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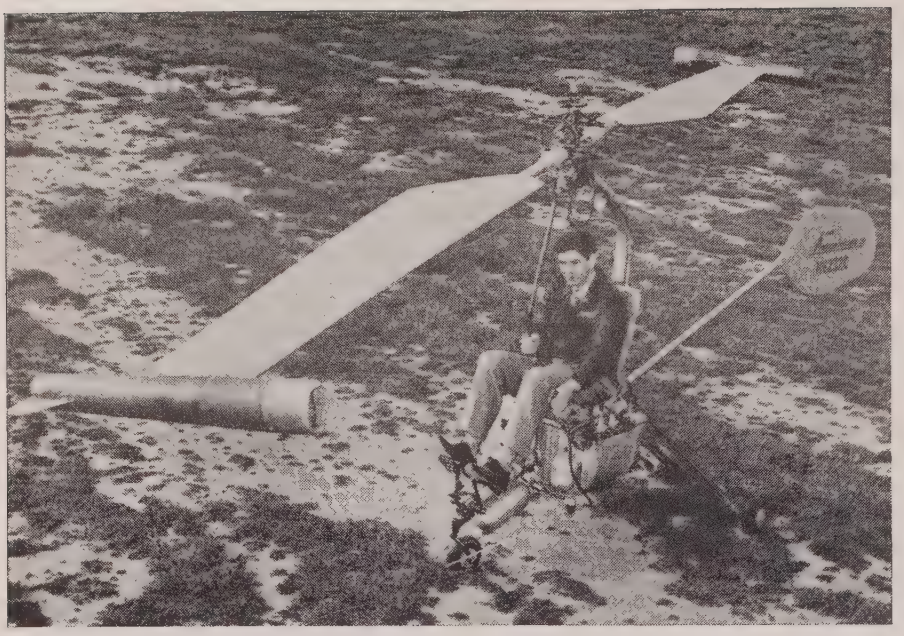


POWERPLANTS of the XA-6 single-place helicopter *(above)* are conical pulse-jet engines

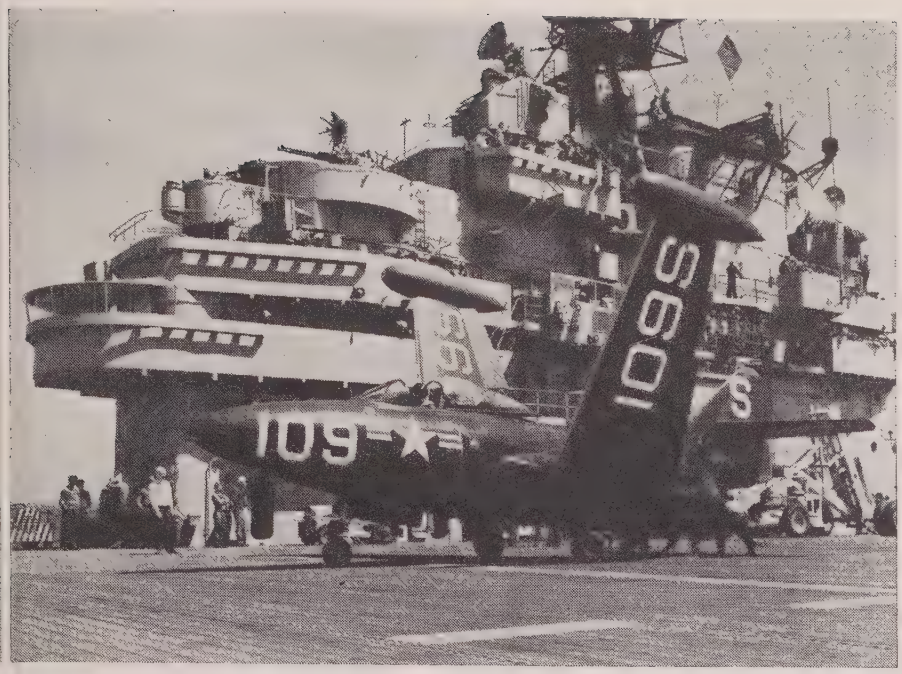
ROTOR driven by tip-installed engines, there is no need of torque compensation

Jet "Buck Private"

An extensive experimental program is underway in California involving the pulse-jet-powered helicopter designed and built by American Helicopter Co., Inc. This 'copter, designated XA-6 and called *Buck Private,* was designed, constructed and test flown in a period of less than six months, and it was successfully flown after just two weeks of ground testing. The XA-6 carries one man for approximately one and a half hours without refueling. The two-bladed rotor and controls are mounted at the upper end of the single formed aluminum tube which is its airframe. The powerplant consists of one small conical pulse-jet engine mounted at each of the two rotor blade tips. After the engine is started, it is necessary to supply only kerosene or diesel oil for continuous operation. Fuel is supplied by centrifugal pumping action.

AIRFRAME of the XA-6 consists of a single-formed aluminum tube with small tricycle landing gear mounted at its lower extremity. Note fuel tank

OFFICERS of American Helicopter Co., Inc., are Corwin D. Denny *(left)*, President, and Howard E. Roberts, Vice President in charge of engineering



NAVY PILOT gets set in the cockpit for a carrier take-off in the Grumman F9F *Panther.* Airmen prefer operating jets off flattops because of better visibility in jet

Carrier Jet Over Korea

(*Continued from page 12*)

out of the bitter Korean cold weather. As soon as a jet turned up, its exhaust transformed the exposed and frigid flight deck into toasty, comfortable weather. Handling crews could be seen warming their hands in the exhaust. But when a prop plane turned up, and its slipstream was blasted down the deck, the air temperature plummeted. There was no need to tell spectators and crewmen to take cover.

The operation of our jets off Korea taught us many short cuts and thumb rules. One squadron commander told me that at the beginning of the war, everybody was overconscious about the fuel consumption of the jets. As the war progressed, however, it was found that the jets' endurance was better than anticipated. The length of hops could be and were safely increased.

"In the first months of the war, there was some timidity about launching the jets if the wind was light," a pilot told me. "But after we had operated in combat for awhile, we discovered we could take off and land in almost the same winds as the props."

The Navy has made no claim that the present carrier jets off Korea are good aircraft for the close-support of front-line troops. Only in very rare instances have they been so employed. "Why should we?" one senior officer told me. "We've got the best support aircraft in the world out here, and everybody knows it. We don't need to use the jets."

Of course he was referring to that remarkable aircraft, the Douglas AD *Skyraider,* the Navy's flying arsenal. Able to carry three large bombs, a dozen rockets, and a full load of 20-mm ammunition, it has been the scourge of enemy troops. The AD has also been backed up by the rugged and reliable *Corsair,* no slouch in the ground-support business.

"We aren't saying that jet aircraft will never be used for ground support," is the usual opinion one hears. "We just don't think that our present jets can do a good job." It is plain that the Navy considers the jet a six-month-old infant in the aeronautical field. In some future time with continuing progress, there is a strong possibility that jets can be made effective long-winded, load-carrying planes which will be good support planes as well as fighters.

In combat, the Navy's jets have given an honorable account of themselves. The *Valley Forge's* planes drew first blood over the North Korean capitol of Pyongyang on the 3-4 July strikes when two YAK-9's were shot down. But it was not until November that our jets encountered enemy jets south of the boundary of the Yalu river. In several engagements, two MIG-15's were destroyed, and others damaged. So far as I have been able to determine, none of our own jets received as much as a single bullet hole in these fights.

And yet, our jets have proved themselves capable of sustaining enemy damage. Several have been hit by enemy antiaircraft fire. One pilot flew his plane through some high tension wires strung across a river. Although he had his wings damaged. his canopy shattered, and despite grievous personal injuries from flying glass, he made a safe landing on his own carrier.

One of the jet pilots made an interesting statement to me when I asked him what the operation of our jets in Korea had proved. "Put it down that jet pilots are no different from other carrier pilots," he told me. "The Navy's never gone in for this hogwash that it takes a special pilot to fly a jet. Any carrier pilot who can fly a prop plane can fly a jet."

An air officer summed up the combat operations of the jets succinctly:

"Korea has made the operation of jets on aircraft carriers completely routine," he told me. Then he added with a smile, "In fact, by the end of our tour, the operation of the jets had become so routine that their pilots were treating the rest of us like human beings again."

READYROOM conference finds Navy airmen checking in for pre-flight before another jet strike against the Chinese Communists. Boys note flight info on boards

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INSTRUCTION

INSTRUMENTS

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CAOA Report

(*Continued from page 44*)

Panel. The Directors of the Association have designated Cole H. Morrow of J. I. Case Co., chairman of the Technical Committee, as the regular representative on the Panel, with N. F. Silsbee, Executive Secretary, to serve as alternate.

The Air Coordinating Committee was established in 1945, with responsibility for coordinating Federal policy in the field of aviation. Present membership includes high level representatives from the Departments of State, Navy, Air Force, Treasury, Post Office, Commerce, the Civil Aeronautics Board, National Security Resources Board, and (non-voting) the Bureau of the Budget. All policy decisions have to be unanimous.

Areas in which the CAOA has particular interest include the newly established Aircraft Claimant Division (priority for parts, equipment and supplies), and the following subcommittees of the Technical Division: Air Traffic Control & Navigation Panel (NAV Panel); Aerodromes, Air Routes and Ground Aids (AGA); Aeronautical Communications and Electronic Aids (COM).

Delos W. Rentzel, Under Secretary of Commerce for Transportation, was chairman of ACC while he was chairman of the CAB and may continue; Charles O. Cary is Executive Secretary.

EAC State Plan Revised

A "State Plan for Civil Aviation in Civil Defense" was prepared by representatives from 13 national aviation organizations (including CAOA) last December. It set the pattern under which many of the states have already set up their organization, and offered substantial guidance to many others which for various reasons made some changes in detail.

Since the original plan was prepared, civil defense has become the separate responsibility of the Federal Civil Defense Administration (FDCA), which at the outset did not seem much disposed to give aviation a very important place in civil defense, beyond that of a segment of the general transportation picture.

During the two-day national Civil Defense Conference held in Washington during May, it became evident that aviation had attained a greatly increased stature as civil defense people in Washington and in the States made a more thorough study of all the problems involved. The Emergency Aviation Council was again called together to meet with representatives of FCDA and a revised State Plan was hammered out. As many points will be of interest to CAOA members, copies will be sent out as soon as available.

Since mid-April FCDA has had the benefit of two aviation specialists on the Washington staff, Merrill Armour, Transportation Specialist, Air, and Phoebe Omilie, CAA.

SECRETARY has own desk in company DC-3

Company Planes and the Airlines

In an address before the Airport Operators Council annual meeting in Memphis, Cole H. Morrow made a point which is of considerable interest and which clarifies a general misconception.

He said: "With all this increase in company airplane flying, you might gather the impression that we are a competitor of the scheduled airlines. I think there has been a feeling among many of the airline people that we are taking business away from them. However, let's take a look at the record.

"In almost every company that has bought and operated their own airplane, the amount of scheduled airline travel has increased tremendously. In the J. I. Case Company this has amounted to over 700 per cent, in dollar volume. When we started operating ou first airplane, I think we had 25 airlin travel credit cards in the entire organizatio Today we have well over 300.

"Of course, a portion of this increase i airline travel would have come about na urally along with the general upward tren of air transportation, but I interviewed ov 100 people in the company and found that i over 90 per cent of the cases, these peopl who had not been traveling by air befo had their first introduction to air transport tion in the company airplane. They found ou that it was not a hair-raising experience they found out how airplanes operate, th amazing amount of navigation aids, weath information and other facilities that a available for use; they realized something the speed and convenience of air travel; an they actually began to feel some confiden in air transportation as a result of th company's own private indoctrination. I spite of the fine job the airlines are doin they have some practices which do not ten to sell flying to the potential first-fligh passenger."

Indispensable to Business

A man who operates one of America major bus lines has joined the ranks those who find the use of an airplane indi pensable to his business on the ground. Tha man is Moss Patterson, of Oklahoma Cit whose Mid-Continent Trailways covers 3,00 miles in Kansas, Oklahoma and Texas, an whose huge fleet of buses travels 11,000 mile daily.

"I couldn't get along without my airplan to keep our scattered operations goin smoothly," reported Mr. Patterson. "Ofte we use the airplane to fly parts to strande buses, landing right alongside the highwa to deliver and install them."

Patterson cited as an example the eme gency delivery of 155 pounds of transmi sions case and parts from the company headquarters at Oklahoma City to Buffal Oklahoma. The on-the-spot repairs saved day in which the vehicle would have bee off the road.

Moss Patterson also uses his plane, a Rya *Navion*, in the operation of his 6,000-acre ca tle ranch near Ardmore, Oklahoma. He fli the plane to cattle sales, utilizes it for ranc inspection and commutes daily from the ranc to his Oklahoma City office.

BRITISH EMBASSY operates a de Havilland *Dove*. Several companies have expressed interest in this plane for business use

Radio Lay-Out Eases Operation

Pilot finds that revamping radio set-up simplifies its operation

By EARL O. DAHL

Chief Pilot, Rahr Malting Co.

Traveling to all parts of the United States, in Mexico and in Canada, the executives of our company average 450 hours a year in our twin Beechcraft D-18-S. Because of the convenience and utility offered by company aircraft operation, two smaller planes—a *Bonanza* and a Fairchild 24-W with skiis and floats—augment the Twin Beech for shorter trips between the cities of the midwest.

We have found that our executives can reach out of the way places more easily and more quickly by company plane than with any other method of transportation.

Twin Beech Equipment ▶ Our Twin Beech came from the factory equipped as follows:

One BC-453 200-400 kc LF receiver (surplus); one Bendix 269G ADF; one 53C-1033 marker beacon receiver (surplus); one Collins 17E 2-channel 3105 kc and 6210 kc LF transmitter.

Each radio had its own control head mounted haphazardly wherever possible on the cockpit overhead, between the pilot and co-pilot seats. The bulky control heads resulted in operational confusion due to inconvenient location.

During the summer of 1948 while on a trip from New York to Manitowoc, Wisconsin, our company president G. R. Rahr was riding in his favorite place, the co-pilot's seat. As we skirted the perimeter of a large thunderhead which seems to be indigenous to this area, static racked our ears and made our low frequency radio equipment almost completely useless. The "Boss," thinking out loud, remarked: "Isn't there some kind of radio we can get to eliminate all this static so we can at least talk to the radio stations and get their weather reports?"

Shortly after that trip the Aircraft Radio Corporation's Model 17 VHF transmitter and receiver, was added to our equipment. This proved to be a great communications improvement but the additional control box also helped to increase the confusion in the cockpit.

Inconvenient ▶ Generally, only one pilot is used to fly our Beechcraft. Consequently, this patched-up radio installation was very inconvenient and particularly difficult to use when operating under instrument conditions—and especially when making an instrument letdown when you find yourself talking to the radio controller, operating your radio sets, and flying, all at the same time!

It was evident that the pilot's efficiency in operating the plane would be increased if a better radio arrangement were possible. Also, with the commissioning of the first few omnirange stations in the CAA's program of VHF navigational facilities, the need for a newer type of radio navigational equipment developed.

After over a year of correspondence with many Beech repair stations and radio shops, and pestering every radio man I came across, as well as talking with many pilots, a radio installation which appeared to meet our needs finally crystallized.

New Set-Up ▶ New equipment to be added was; One Beech overhead panel consolidating all radio controls; one ARC F-11 isolation amplifier; one ARC localizer receiver and one ARC glide path receiver (for ILS); one Bendix RA-10 MF receiver; one Collins 17K 6-10 watt VHF transmitter; one ARC Type 15B omni receiver.

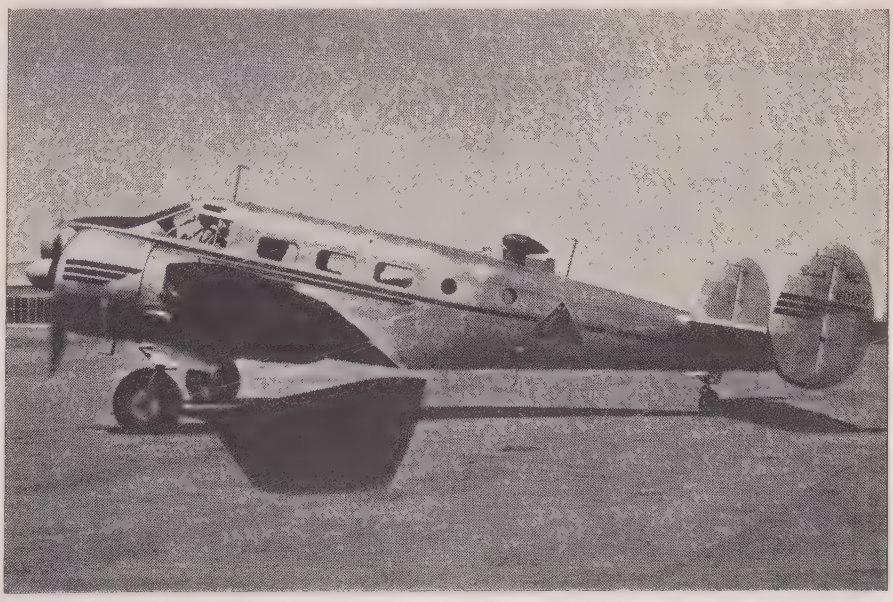
Old equipment to be retained: Collins 17E 100-watt transmitter, modified to include both 3105 kc for domestic and 6595 kc for overseas airway control; ARC Type 17 VHF transmitter and receiver; Bendix radio compass (ADF); and BC-1033 marker beacon.

No doubt other equipment could do the job better, but either cost or weight was the determining factor. It was felt that this arrangement was an economical and practical solution to the problem of providing a complete duplication of both VHF and LF radio facilities, which would permit using most of the anticipated new navigational facilities and also provide for still further improvements.

Installation ▶ At Southwest Airmotive Company, Dallas, George Handwork, the radio shop manager, completely designed and closely supervised this installation while our airplane underwent a 2,000-hour check and engine change. The old radio wiring was completely replaced and several pieces of radio equipment were cleverly mounted behind the instrument panel, thus keeping the main cabin free of radio equipment and also

(*Continued on page* 64)

TWIN BEECH, owned and operated by Rahr Malting Company, is one of the company's fleet of three planes: *Bonanza*, Fairchild and Twin Beech. Twin Beech averages 450 hours a year



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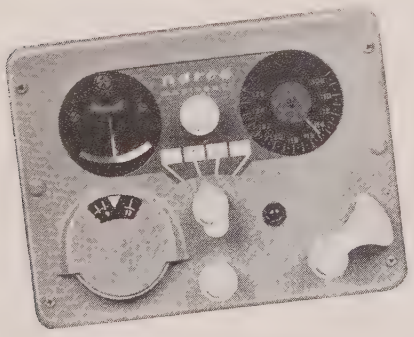

Omnihomer VHT-1

NARCO'S new Omnihomer is packaged and priced to fit the budget of all aircraft owners. Though the cost is low, it delivers NARCO precision performance! The new Omnihomer is precision built, weighs only 8½ lbs.; offers static-free 2-way VHF, course selector, left-right meter with built-in "to-from" indicator. Small, only 5¼" x 6⅞" x 10¼", NARCO'S Omnihomer is easy to install, since there is only one unit to mount on the instrument panel. See your nearest NARCO dealer for a demonstration.

DELUXE

For those who desire the ultra in omnigation, NARCO'S VTR-1 Omnigator has all the above features, PLUS ILS, marker beacon receiver, and 8-channel VHF transmission.

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Perfection in electronics

Radar to Rescue Airport Traffic

Washington Nat'l Airport chosen as guinea pig to work out procedures

by Col. N. F. Silsbee

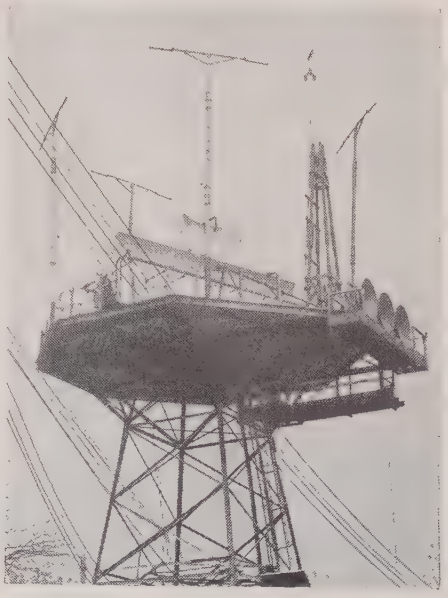
Washington National Airport has been chosen as the guinea pig for the implementation of procedures and equipment to put the important "SWiG-5" program into effect. This program was published in the report "Air Navigation and the National Security" after several months of concentrated effort by the Operational Policy Group of the Air Coordinating Committee's NAV Panel. This group of specialists from all interested agencies was also called Special Working Group 5 (SWG-5), hence "SWiG-5 program."

According to the SWiG-5 Report, radar has been chosen as the primary traffic control aid, and Washington as the site for the first full-scale radar control center.

The city's airways are clogged by swarms of planes from 55 airports and airfields within a 50-mile radius of the Capital, making this city perhaps the busiest air terminal in the country.

Costly Delays ▶ The crux of the air-traffic problem is how many planes Washington National can handle when the weather is bad and special aid must be given pilots to bring their planes down safely and quickly. WNA is the third-ranking commercial airport in the country, but it led both Chicago and New York in aerial delays. The main reason for this is that Washington National must serve both Bolling AFB and Anacostia NAS across the Potomac River when weather conditions are poor.

RADAR is the tool which will straighten out snarl of air traffic at Washington



During good flying weather, an airplane can be landed every two minutes, but under adverse conditions a minimum of three and a half minutes is required for each actual landing. The objective of the SWiG-5 people is to make possible landings, take-offs, or any combination of landings and take-offs at the rate of 40 movements per hour, or one every 90 seconds. This rate was actually achieved at the two-day operational demonstration put on by SWG-5 last November at Wright-Patterson AFB in which jet fighters, small and large transports, and private planes used the same type of equipment.

Work on the radar control center at WNA is now well advanced under the direction of Bert Moore, Chief of the Air Route Traffic Control Division, CAA. Present plans call for its operation by late summer or early fall.

The USAF's CPS-1 (or MEW long-range radar), now used to route military traffic around Washington National to Andrews AFB and beyond, is being turned over to CAA traffic controllers. These men will re-route military traffic as required and also monitor all civil traffic movements within the 70-mile area of the terminal. The coaxial cables between the radar antenna and control tower have been reworked for the new program, and the existing radar room at the center has been enlarged for use as a radar control room.

Repeater Scopes ▶ The U.S. Navy has made a major contribution to the program by turning over two of their VG-2 Skiatron projection-type repeater radar scopes. These give the controller a picture of the area and the traffic in the area on a 24-inch viewing screen mounted horizontally (the regular radar scope has a 12-inch diameter). One of these units will be operated from the CPS-1 long-range radar, set at a range of about 40 miles. The other Skiatron will operate as a repeater scope from the ASR-1 radar, which has a 30-mile range. The Skiatrons will permit the use of marking devices to follow the aircraft targets so that once established, the identity of the aircraft can be retained, thus simplifying the controller's job.

In addition to the Skiatron, the radar control room in the center will contain six 12-inch surveillance scopes which will operate from the CPS-1. These scopes can be used to cover various ranges, or they can be off-centered to scan different sectors of the enroute area beyond the

irport, providing the controller with a nore detailed picture of the traffic in ach sector scanned. With all due consideration of the delays inherent in offiial projects involving interdepartmental ooperation, it appears that the operaional people have been a long time atching up with the possibilities of adar for civil aviation use.

Four Controllers ▶ Four of the individual scopes will be manned by a separate ontroller and will cover one of the four uadrants. Although all four scopes give he same presentation, each controller will be responsible only for the airplanes n his designated quadrant. As each lane enters his sector, the controller will talk with the pilot on VHF, get ight-plan details, identification, altiude, estimated time of arrival, etc. When the VHF-ADF equipment is availble, this will be installed in the control oom, and will provide an electronic racer line on the radar scope each time VHF radio contact is made with an airlane. This will give the controller autonatic information on the bearing of the ircraft from the station, and also a aluable aid in locating lost aircraft.

The control room will be equipped ith flight progress boards for posting nformation on flights in the usual manner, to provide for coordination between adar control and the manual control xercised by the remainder of the center. Coordination between the radar control nit and controllers handling other secors will be accomplished in the early ages by means of an interphone. Mehanical interlock equipment supplemented by an interphone will provide or the exchange of information needed o coordinate the activities of the tower nd the center (see full description, *KYWAYS*, February 1951, pp. 60-61).

The other two repeater scopes will be sed to monitor departing aircraft. Each ontroller will monitor a 180° arc instead of the 90° of the approach controllers.

Pilot Procedures ▶ In planning the procedures to be used every effort has been made to make the transition as simple s possible from the standpoint of the ilot. Actually, control instructions reeived by and reports required from the ilot and general flight procedures in he area will differ only in minor reoects from what is in effect today. The ajor difference will be in the ground rocedures. Where the separation proided today is based on reported posions over radio fixes and estimated posions over other fixes based on these eports, the separation under radar conol can be accurately determined by bservation of the aircraft targets on the adar viewing screen.

The biggest change to be made, from he pilot's standpoint, will be in the pproach control area. Here there will be a considerable increase in radar vectoring in inbound aircraft to provide the final spacing of the aircraft on the final approach. Vectoring techniques will be used to vary the flight path of aircraft from specific fixes to which they are cleared to the point where the aircraft turn on to final approach. Some vectoring will also be used in the area under center control as required to place inbound aircraft in proper sequence and promote a smooth, expeditious flow of traffic. Vectoring may also be used as needed to expedite the movement of departing aircraft, but there is not expected to be much of this.

Discontinuance of L/MF Radio Range Stations Begun

The CAA has requested the seven domestic Regional Administrators to review their 1952 plans for the discontinuance of selected L/MF four-course radio range stations. For budgetary and operational regions, the CAA cannot continue indefinitely the maintenance of two systems of radio navigation throughout the United States. A few L/MF ranges must be discontinued in each continental region during fiscal year 1952 (ends June 30, 1952).

Charles F. Horne, while still Acting Director of Federal Airways, sent out a letter to various groups of users of the airspace for advice and counsel in developing a satisfactory program which would have a minimum impact on aircraft operations of all types.

As an example of how this is being done, the Chief of the Planning and Evaluation Division of the Fifth Region, Kansas City (includes Colorado, Iowa, Kansas, Missouri, Nebraska, South Dakota, Wyoming) sent a letter to approximately 90 airports in the Fifth Region naming eight low and medium frequency radio ranges which had been tentatively selected for discontinuance during fiscal '52. Five of these were in Missouri, with one each in Iowa, Kansas and Nebraska. The selection was based on questionnaires sent out in late 1950, supplemented by extensive studies along other lines. All of the selected locations will be served by omnirange facilities, and in some cases ILS will also be in operation.

Copies of this letter were also sent to various user groups. Comments from representatives of these groups as well as from the airports receiving the letter were requested to be in by May 7th for presentation at a meeting May 10.

All this means that CAA statements and rumors during the past two or three years to the effect that as the VOR program developed the old L/MF ranges would have to be gradually discontinued, have passed into the action stage.

THE WEEMS LINE includes many navigation aids and instruments which are standard equipment with U. S. Air Forces, major air lines and foreign governments. Many are navigation "musts" for pilot and student alike, especially the Weems Mark II Aircraft Plotter, the Dalton E-6B, or Mark VII Computer. A few of them are described below. Many others are available.

WEEMS MARK II PLOTTER: Scale fits sectional and world air charts. Used for plotting bearings, courses, measuring distances, constructing wind diagrams and angles. Only $2.00.

DALTON E-6B COMPUTER: Two sides. One for solving all vector problems—wind, true heading, ground speed. Other side graduated for computing speed-time-distance, fuel consumption, air speed and altitude corrections, as well as statute-nautical mile conversions. Only $10.00 complete.

DALTON MARK VII COMPUTER: Vector side "mocks-up" track-drift-true heading triangle, allows simple, easily oriented setting-up and solution of all wind problems. Computer side for speed-time-distance, fuel consumption, air speed and altitude corrections, and statute-nautical mile conversions, plus erasable air speed calibration chart and flight log. Only $5.00.

WEEMS PROPORTIONAL DIVIDERS: Given any two of three quantities (speed, time, distance), you can find the third in a few seconds. $24.00.

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IMPORTANT NEW BOOKS: *Flying The Omnirange* by Zweng. Tells how to fly cross-country by means of new Omnirange facilities. $4.00.

Practical Air Navigation by Lyon. Invaluable to pilot and student alike. $2.50.

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New Radio Lay-Out

(*Continued from page 61*)

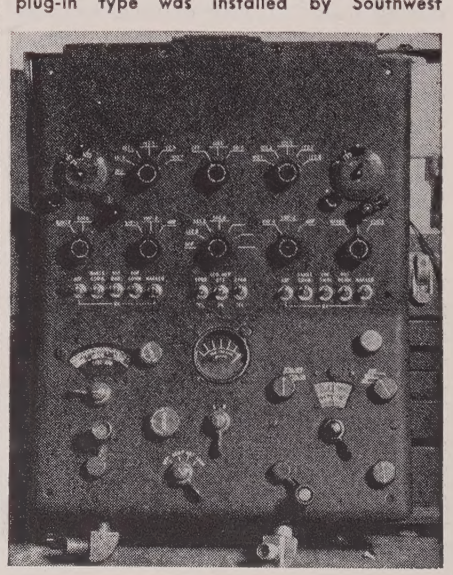
maintaining the C/G location as far forward as possible.

This radio installation has now been operating for well over a year and a half with only very minor troubles which have been easily corrected. Having the overhead control panel of the quick plug-in type has facilitated fast and efficient checking of the installation. We also have a complete set of blueprints that are carried in the plane so if radio trouble should develop a radio technician not familiar with our particular installation can check all the wiring details and location of equipment.

Because our home base is so far from any adequate radio repair stations, I have been particularly pleased to find such trouble-free service as we have experienced from the new installation. At no time have we been completely without radio facilities when one set has gone sour due to antenna icing or some mechanical cause—thanks to the duplication of equipment.

With the new set-up actual operation of the radio equipment has been simplified and as a result, instrument flying is facilitated. Compared with our earlier experiences, using the static-free VOR navigational facilities last summer was like "Sunday on the Farm." Using the ILS to bring your plane right down the center of the runway, in low ceilings and visibility, is wonderful compared to the old way of making an instrument let-down, when we were as busy as a one-armed paper hanger. Although we do not make a habit of flying marginal weather, it is a great comfort to know we have this equipment, and that it will be working to our advantage and for our safety should we get into a tough spot some day or night.

NEW RADIO equipment including overhead plug-in type was installed by Southwest



Radio Questions Added to Commercial Pilot Examination

According to a recent announcement by the CAA, new issues of commercial pilot written examinations will include questions on radio. E. S. Hensley, Director of the CAA's Office of Aviation Safety, stated that because of the increasing importance of radio in aviation, it is deemed advisable that commercial pilots should be familiar with certain basic principles and procedures of radio navigation and communication.

He added that the CAA is aware that many applicants for a commercial pilot rating have never flown radio-equipped airplanes, and in some cases may have had no opportunity to operate radio equipment in flight. For this reason the CAA cannot include radio techniques as mandatory in flight tests. However, there is no doubt that commercial pilots without the ability to utilize radio would be seriously handicapped in many flight situations, and the promotion of aviation safety justifies the inclusion of questions on radio utilization in the written examination for a commercial pilot rating.

Questions to be asked will be chiefly concerned with:

1. Tuning the radio to appropriate frequencies to communicate with ranges and towers for receiving weather information and instructions for landing.

2. Use of approved methods and phraseology for communicating with control towers and airways stations. This information is available in the CAA publications "Facts of Flight," and the "Flight Information Manual."

3. Use of omniranges for navigation and use of the four-course L/MF radio ranges for determining fixes by beam intersections and quadrant identification. This will not include "orientation procedures" as used in instrument flying. Essential information is available in the CAA publication "Practical Air Navigation," and on the reverse side of all sectional charts.

Basic Omnirange Flying

An attractive 5 x 7½" booklet bearing the above title has just been put out by the CAA. It is a revision of the text issued by the CAA in June 1950, under the title of *Flying the Omnirange*, which had a somewhat limited circulation. (It was summarized in *SKYWAYS*, December 1950.)

The new booklet has been sent out to all CAA centers and stations for information to pilots on how to use the VHF Omni-directional Radio (VOR) range stations being installed throughout the country, of which more than 360 were operating on April 30, 1951.

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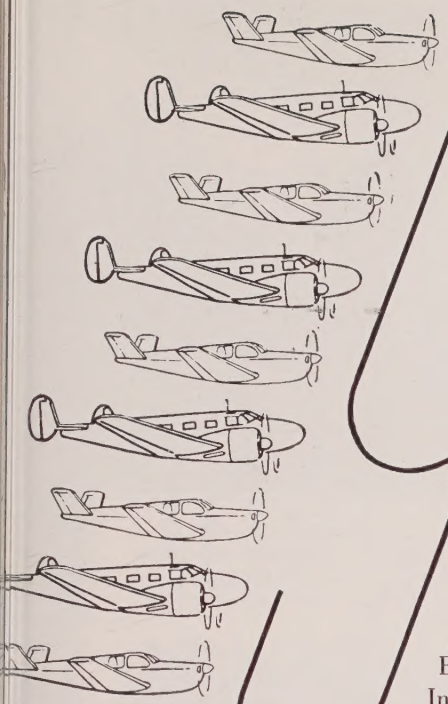

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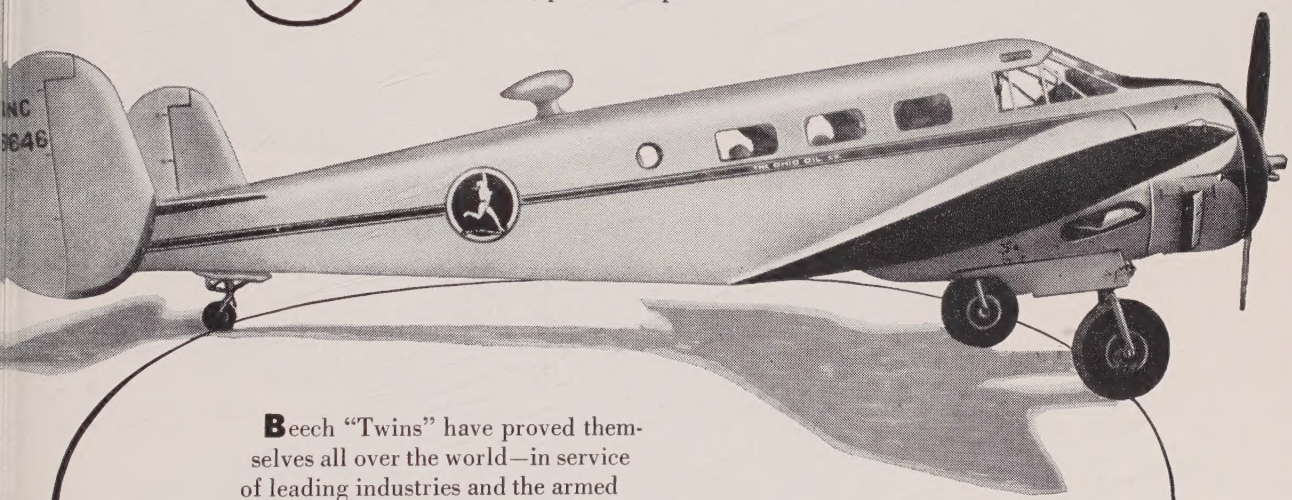

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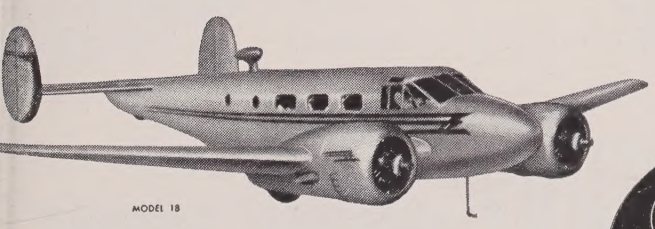

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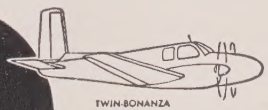

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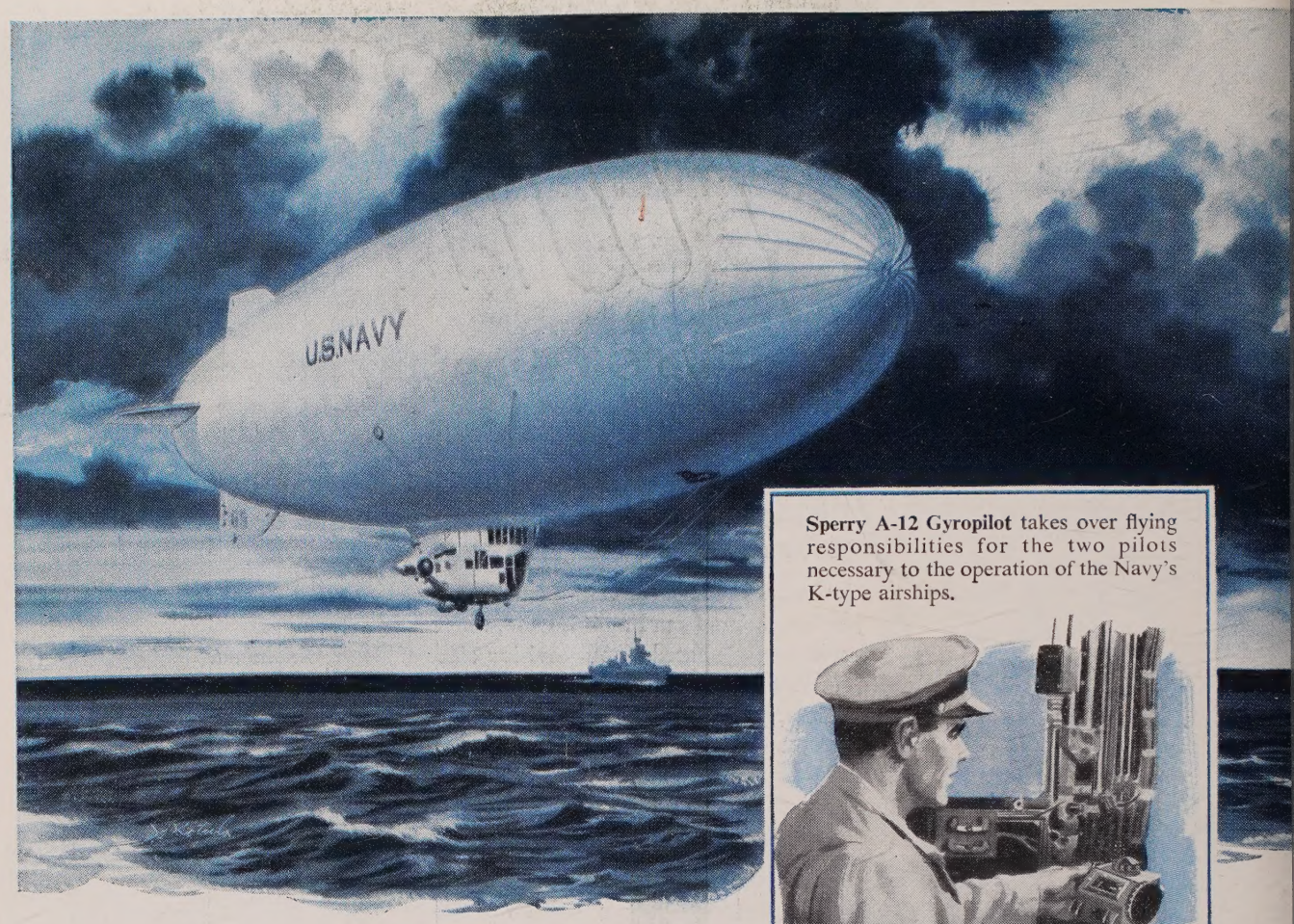
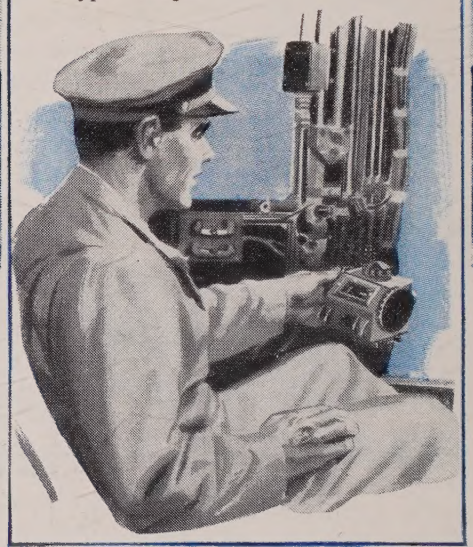


Sperry A-12 Gyropilot takes over flying responsibilities for the two pilots necessary to the operation of the Navy's K-type airships.



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► With the Sperry A-12 Gyropilot* aboard, pilots of the Navy's K-type airships will now be able to concentrate on the important task of directing search and rescue operations. For in the past, two human pilots were kept busy with the tough job of handling these craft . . . constantly moving controls to keep the ship on course and at the desired altitude. The Gyropilot not only relieves the human pilots of this strain but considerably increases the accuracy of navigation.

► Due to its electronic rate circuits, the Gyropilot prevents over-control, guides the ship with much less control surface motion and steers what for an airship is virtually a deadbeat course *even in rough air.*

► With the installation of this automatic pilot on the entire fleet of K-type airships operating out of the U. S. Naval Air Station at Lakehurst, N. J., the human pilots can devote more time to the scientific patrolling of coastal waters . . . to the accomplishment of arduous missions with accuracy.

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